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## DISEASES CAUSED BY BACTERIA AND FUNGI

ELEK, S. D. & LEVY, E. (1950.) **Distribution of haemolysins in pathogenic and non-pathogenic staphylococci.**—*J. Path. Bact.* 62. 541-554. [Authors' summary copied *verbatim*.] 2221

A plate method designed for the analysis of staphylococcal haemolysins is described. The method combines qualitative differentiation with specific neutralisation. 359 strains of staphylococci were examined. In view of their origin 200 of these were regarded as human pathogens and 59 as animal pathogens, since they came from lesions and were coagulase-positive. A further 100 unselected strains were obtained from the skin and noses of healthy carriers.

Three distinct haemolysins were found to be associated with coagulase-positive strains. These were identified as the  $\alpha$ ,  $\beta$ ,  $\delta$  haemolysins previously described. Coagulase-negative strains on the other hand produced none of these, but a high proportion of them showed uninhibited haemolysis designated  $\epsilon$ .

All seven possible combinations of the three haemolysins produced by coagulase-positive strains have been demonstrated. Certain combinations showed a predominance amongst human pathogens, while different combinations were more frequent in the animal group. The coagulase-positive strains from human carriers showed the same patterns as those from lesions.

Neither  $\alpha$ -, nor  $\beta$ - or  $\delta$ -lysin production was correlated absolutely with coagulase production, but  $\alpha$  and  $\delta$  occurred very frequently in human strains.  $\beta$  lysin was characteristic of animal strains and uncommon in human strains. One of the three lysins was invariably present—either alone or in combination—in all coagulase-positive strains.

The significance of  $\beta$ -lysin production as an index of animal origin is discussed. A simple method for its demonstration was found in anaerobic cultivation on sheep red cells.

Evidence in support of the view that  $\alpha_2$  and  $\gamma$  lysins are identical with  $\delta$  lysin is discussed.

The use of the term "haemolytic staphylococcus" implying pathogenicity is to be deprecated as meaningless.

Marks, J. & VAUGHAN, A. C. T. (1950.) **Staphylococcal  $\delta$ -haemolysin.**—*J. Path. Bact.* 62. 597-615. [Authors' summary copied *verbatim*.] 2222

The existence of a staphylococcal haemolysin,  $\delta$ -lysin, distinct from  $\alpha$ - and  $\beta$ -toxin, has been confirmed. The lysin is dermonecrotic and haemolytic for all species of red cells tested. It can be recognized by its lysis of washed human and horse cells at 37° C. It acts synergistically with  $\beta$ -toxin on human and sheep cells. It is soluble in ethyl alcohol but not in ether or acetone.

Coagulase-positive staphylococci derived from lesions were shown to produce significantly more  $\delta$ -lysin and  $\alpha$ -toxin than did coagulase-positive staphylococci isolated from carriers. There was a significant positive correlation between the amounts of  $\delta$ -lysin and  $\alpha$ -toxin produced by individual strains.

GOCHNAUER, T. A. & WILSON, J. B. (1951.) **Hyaluronidase production *in vitro* by streptococci isolated from bovine mastitis cases.**—*Amer J. vet. Res.* 12. 20-22. [Authors' summary copied *verbatim*.] 2223

A relationship could not be established between the production of hyaluronidase *in vitro* by mastitis streptococci and the severity of the inflammation of the quarter of the udder from which they were isolated.

A relationship could not be demonstrated between hyaluronidase production by mastitis streptococci *in vitro* and the percentage of udder quarters freed for a period of one week from the original species of *Streptococcus* by treatment with penicillin, sulfamethazine, or diamino diphenyl sulfone.



ROBERTSON, O. H. & LESTER, W., Jr. (1951). **The lethal effect of triethylene glycol vapor on dried air-borne bacteria.**—*Amer. J. Hyg.* 53. 69–79. [Abst. from authors' summary.] 2224

A study was made of the bactericidal action of triethylene glycol vapor on air-borne *Streptococcus hemolyticus* group C and *Staphylococcus albus* which had been desiccated either by exposure of atomized suspensions to atmospheres of very low relative humidity for many hours or by evaporation of frozen cultures in vacuo; the latter preparations were finely ground and dispersed into the air as a dust. Glycol was evaporated rapidly and in sufficient quantity to saturate the air quickly so that the rate of killing could be determined. The effects on glycol action of relative humidity, duration of the period of desiccation, nature of suspending medium and size of bacterial particles were recorded.

Dried bacteria were highly susceptible to the lethal action. Freshly atomized bacteria were killed less rapidly than micro-organisms which had been floating for a period of 5 hours in an atmosphere of low relative humidity. The rate of kill of air-dried bacteria was highest at low humidity, e.g., 15 to 20 per cent; with rising relative humidity, the death rate decreased. As the duration of the air-drying period was extended from 5 hours to 20 hours, the rate of kill by the glycol at low humidities was much diminished. Glycol vapor is effective against bacterial particles as large as 8 to 10  $\mu$  in diameter, although they are not killed as rapidly as those of 3 to 4  $\mu$  or less.

ARGUN, T. (1946.) **Türkiyede Şarbon Epidemiyolojisi.** [Epidemiology of anthrax in Turkey.]—*Türk. Veterinerler Cemiyeti Dergisi*, 16. pp. 102–119. 2225

Areas from which the disease is mainly reported lie in the European region and towards the north-west and west of Asia Minor, i.e. around the Sea of Marmora and adjacent Black Sea coastal area. This country is mostly low-lying, below 200 m., is well supplied with water and the climate is mild or hot. In 1936–45 outbreaks in animals averaged 418 annually. Most are in sheep, than goats and cattle, less in horses. The disease was reported from 11% of Turkish villages, while it is estimated that of the susceptible animal population found in known anthrax areas in these years 1.3% had anthrax, and the annual mortality was over 6,000. The peak incidence of infection is August. Reference is made to the likelihood of many cases, especially in certain areas, escaping notice and to the risks arising from undiagnosed or wrongly diagnosed cases. Vaccination, first introduced extensively

as early as 1936, has not stopped the rising trend. According to the reports, during the seven years from 1936–42, there were 2,505 cases in man of which 225 were fatal.—S. ALPAR.

ER, I. E. (1948.) **Şarbon Profilaksisinde mezbaha muayenelerinin önemi.** [Abattoir control in prevention of anthrax.]—*Mikrobiyoloji Dergisi*. 1. 251–259. [English and French summaries.] 2226

By Turkish law, municipalities have to provide abattoirs in their areas. There are now over 400 abattoirs in the country and 120 of them can be described as modern installations. The largest is in Istanbul where 900,000 sheep and 60,000 cattle are slaughtered annually. Carcasses of animals slaughtered outside abattoirs must be presented at an abattoir for examination. They are first examined for anthrax and infected ones are at once incinerated. In 1946 and 1947, out of 262 such carcasses brought to the Istanbul abattoir, 14 were found to be affected with anthrax.—N. KARAMIZRAK.

WOLFF, A. H. & HEIMANN, H. (1951.) **Industrial anthrax in the United States. An epidemiologic study.**—*Amer. J. Hyg.* 53. 80–109. [Authors' summary and conclusions slightly modified.] 2227

In recent years human anthrax of industrial origin has become of increasing importance in the United States, especially in the New England and Middle Atlantic States. This increase in incidence is due essentially to the handling of imported hair and wool, especially of the latter.

The present study indicates that carpet wool, in contradistinction to apparel wool, is the responsible agent. Further it is shown that carpet wools which originate in certain parts of Asia, North Africa, and possibly Southern Europe are especially infective. Human anthrax attributable to the handling of animal hair is shown to be due essentially to goat hair, particularly that originating in certain parts of Asia. Human anthrax in the leather industry is shown to be due essentially to goat skins, particularly those originating in certain parts of Asia. Recommendations for the control of industrial anthrax are presented, and include the problem of importation as well as the processing of hides, skins, hair and wool.

ARGUN, T. (1950.) **Türkiyede Sığır Tübekülozu Epidemiyolojisi.** [Epidemiology of bovine tuberculosis in Turkey.]—*Mikrobiyoloji Dergisi*. 3. 180–187. [French summary.] 2228

The following points arise. The disease is irregularly distributed. It is believed to be



absent in mountainous areas and is prevalent in cities. Infection is lower among country-bred animals than in imported ones. In 1940, on government farms 10% of 2,869 cattle reacted to tuberculin but the disease has now largely been brought under control. Since 1940, 23,400 cattle in 73 villages have been examined; among these the percentages of tuberculous animals were 6 in oxen and cows, 4 in bulls, 2 in calves and 3 in buffaloes. In the Istanbul abattoir, out of 377,572 cattle slaughtered 4.5% were tuberculous; of these 87% were thoracic infections, 26% were intestinal infections and in 8% the lesions were generalized.

—N. KARAMIZRAK.

DERBES, V. J., DENT, J. H., WEAVER, N. K. & VAUGHAN, D. D. (1950.) Response of tuberculin skin test to ACTH and cortisone in tuberculous guinea pigs.—*Proc. Soc. exp. Biol., N.Y.* 75. 423-426. [Authors' summary copied verbatim.] 2229

ACTH and Cortisone when given in proportionately large doses modified but did not abolish cutaneous tuberculin reaction in guinea pigs infected with virulent tubercle organisms. Following administration of ACTH and Cortisone the histopathologic changes consisted in a quantitative diminution in the inflammatory exudate rather than a qualitative change in its cytologic structure.

SHELDON, W. H., CUMMINGS, M. M. & EVANS, L. D. (1950.) Failure of ACTH or cortisone to suppress tuberculin skin reactions in tuberculous guinea pigs.—*Proc. Soc. exp. Biol., N.Y.* 75. 616-618. [Authors' summary slightly modified.] 2230

Guinea pigs with active progressive tuberculosis were given ACTH or cortisone for 6 days. A definite tuberculin skin reaction was obtained in all animals during the period of hormone administration. The reaction appeared less marked in the treated animals than in the controls. It is suggested that neither ACTH nor cortisone interferes primarily with the immune mechanism of the tuberculin skin reaction but both decrease the associated acute inflammatory process.

SPAIN, D. M., CHILDRESS, W. G. & FISHLER, J. S. (1950.) The effect of 4-acetylaminobenzal thiosemicarbazone (tibione) on experimental tuberculosis in guinea pigs.—*Amer. Rev. Tuberc.* 62. 144-148. 2231

G-pigs experimentally infected with TB. responded satisfactorily to injections of tibione. This response compared favourably with the

effect of injections of streptomycin and half dose levels of each drug given together were as effective as either alone.—R. MARSHALL.

SPAIN, D. M. & MOLOMUT, N. (1950.) Effects of cortisone on the development of tuberculous lesions in guinea pigs and on their modification by streptomycin therapy.—*Amer. Rev. Tuberc.* 62. 337-344. [Spanish summary.] 2232

Tuberculous lesions appeared to be more extensive and more widely distributed in experimentally infected g. pigs which were given cortisone than in controls. This was true both in animals in which the infection was unchecked by chemotherapy and in a group in which the infection was partly controlled by streptomycin.

—N. DEAN.

SMITH, C. R., NISHIHARA, H., GOLDEN, F., HOYT, A., GUSS, C. O. & KLOETZEL, M. C. (1950.) The bactericidal effect of surface-active agents on tubercle bacilli.—*Publ. Hlth Rep., Wash.* 65. 1588-1600. 2233

A survey is presented in tabulated form of the bactericidal action against tubercle bacilli of 142 surface-active agents, including anionic, cationic, and nonionic groups. These agents are not good disinfectants against the tubercle bacillus. Only one preparation, Armeen 14 D (cationic, 90% tetradecylamine) was found sufficiently active to be considered for practical purposes.—W. R. BETT.

TAYLOR, A. W. (1950.) Observations on the isolation of *Mycobacterium johnei* in primary culture.—*J. Path. Bact.* 62. 647-650. [Author's summary copied verbatim.] 2234

For the primary cultivation of *Mycobacterium johnei* from tissue, the use of oxalic acid is recommended; from faeces, antiformin is the only substance so far available which is effective in controlling contamination.

Simple media containing at least 50 per cent. of egg-yolk are more reliable than complex mixtures of whole egg and liver extract.

GOLEM, S. B. (1949.) Türkiye beygirlerinde difteriye karşı hazırlanmış normal muafiyet. [Natural immunity against diphtheria in Turkish horses].—*Türk İjiyen ve tecrübi biyoloji Dergisi.* 9. pp. 156-181. [French summary.] 2235

During 1937-45, the blood antitoxin content was tested in 817 horses (3-23 years old), 15 mules and 9 donkeys, using the Römer technique in g. pigs. A content of 1/30 unit or higher of diphtheria antitoxin was found in 220 horses, 6 mules and 5 donkeys. The further east one travels in Turkey, the greater the decrease in the



percentage of immune horses, and in the south-east it is lowest.—H. ANTEPLIOGLU.

SELVI, N. & PAYKOÇ, Z. (1949.) Streptomycine ile iyi had bir ruam vak'ası. [Treatment of acute glanders with streptomycin.]—*Türk. İjiyen teczrübî Biyoloji Dergisi*. 9. pp. 9-16. [English, French and German summaries.] 2236

Glanders is a rare disease in man in Turkey. During the past 10 years 18 cases have been reported of which 5 were treated in the main hospital in Ankara. In May 1949 a farmer was admitted with severe prostration and multiple small abscesses on the chest, arms and legs. His horse had died 15 days earlier. The history symptoms and clinical condition suggested glanders. One of the abscesses was punctured and a smear of the pus revealed Gram-negative bacilli in small numbers. The patient's serum reacted at 1:100 by the agglutination test and also fixed complement. A skin test with mallein was positive. Treatment with streptomycin, 2 g. daily, was started immediately and continued for 10 days when the dose was reduced to 1 g., until a total of 50 g. had been given. In addition, during the first 10 days daily dosage was given of 600,000 I.U. penicillin and 6 g. sulphadiazine. The response was prompt, fever disappeared after six days, the abscesses drained and cleared in a fortnight and during three months' observation there were no relapses.

—M. SERTEL.

GÖREN, S., İREN, Z. & DEMİRER, T. (1949.) Streptomycin'le tedaviye alınan bir insan ruami vak'asında laboratuvar arastirmaları. [Streptomycin in glanders in man.]—*Türk İjiyen ve teczrübî Biyoloji Dergisi*. 9. 17-23. [English summary.] 2237

A further reference to the same case as in preceding abst. A culture having the appearance of *Pf. mallei* was obtained from the pus on glycerol potato medium. This culture was not agglutinated by a known positive serum but acted as a specific antigen in the complement fixation test. Pus from the cutaneous nodule gave a Straus reaction after three days.

—M. SERTEL.

GRUNBERG, E. & ELDRIDGE, D. (1950.) Studies on the *in vitro* drug resistance of *E. coli* towards mixtures of sulfonamides.—*Yale J. Biol. Med.* 23. 184-189. [Abst. from authors' summary.] 2238

In *in vitro* experiments with *Bact. coli* for the study of drug resistance towards sulfonamides three types of sulfonamides could be differen-

tiated according to initial bacteriostatic activity and speed of occurrence of maximal resistance: (a) sulfonamides of high initial activity and high avidity, sulfathiazole and sulfadiazine; (b) sulfonamides of high initial activity and low avidity, sulfamerazine; and (c) sulfonamides of both low initial activity and low avidity, sulfacetamide. In the triple mixture of sulfonamides the presence of two components of high activity and high avidity overcame, as a rule, the influence of one component of low avidity. The presence of two components of low avidity in a triple mixture consistently resulted in the rapid development of a resistant strain. Included in these studies was work with a new sulfonamide, Gantrisin [3,4-dimethyl-5-sulphanilamido-isoxazole]. It belongs to the group of high initial activity and high avidity.

CRUICKSHANK, J. C. (1950.) Bacillary dysentery in laboratory monkeys. I.—Natural infection of a rhesus monkey with four pathogenic bacteria, including two species of dysentery bacilli.—*Mon. Bull. Min. Hlth publ. Hlth Lab. Serv.* 9. 277-278. 2239

CRUICKSHANK, J. C. & BRAY, R. S. (1950.) Bacillary dysentery in laboratory monkeys. II.—An outbreak in monkeys due to *Shigella flexneri* 103 Z.—*Ibid.* 278-279. [Authors' summary copied verbatim.] 2240

I & II. An outbreak of bacillary dysentery in monkeys in an animal house is described. A rhesus monkey, *Macaca mulatta*, died with signs of acute enteritis shortly after admission. At post-mortem examination, *Str. pyogenes* was isolated in pure culture from the heart blood, and *Salmonella typhi-murium*, *Shigella sonnei*, and *Shig. flexneri* Type 103 Z (4b) were isolated from the intestine. During the subsequent two months infections due to the same type of Flexner's bacillus continued to appear in monkeys housed in adjoining rooms, in spite of attempts to limit the outbreak by isolation and cage-sterilization. The outbreak came to an end after all the monkeys had been given a course of sulphaguanidine in a mixture of ground biscuit and treacle. One animal was rendered bacteriologically negative only after a second course of treatment.

PAYZIN, S. (1949.) O. Lahorensis Kenelerinde enteritidis Gaertner basili. [*Salmonella enteritidis* Gaertner in *Ornithodoros lahorensis*.]—*Türk İjiyen ve teczrübî Biyoloji Dergisi*. 9. 82-85. [English summary.] 2241

Ticks were collected from localities in Turkey, where Q fever had been reported, and suspensions made from them were injected into



g. pigs. In this way some *O. lahorensis* ticks produced illness in the test animals, which was proved to be due to *S. enteritidis* var. *gaertner*. Two hospital cases are also mentioned, in which the same organism was isolated from blood or faeces and was presumed to be responsible for the illness.—H. ERGÜN.

NEELY, R. A. & NELSON, M. G. (1951).—**Salmonella food poisoning due to duck eggs, with a trial of chloramphenicol on the carrier state.**—*Mon. Bull. Min. Hlth publ. Hlth Lab. Serv.* 10. 96–101. [Authors' summary copied *verbatim*.] 2242

An outbreak of food poisoning due to *Salm. typhi-murium* among the nursing and auxiliary staff of a hospital is described. The vehicle of infection was a lemon meringue pie which was eaten by 89 persons, of whom 44 (49.4 per cent.) were affected. Twenty-eight asymptomatic excretors were discovered.

Duck eggs used in the preparation of the pie were the probable source of infection. Experiments showed that salmonellae, if present in large numbers in an egg yolk and cornflour mixture, could survive the heating conditions of preparation, namely 100° C. for ten minutes followed by 60° C. for twenty minutes. It is emphasized that no method of cooking duck eggs can be recommended that does not result in coagulation of the yolk.

In a small controlled trial, chloramphenicol in a dosage of one gram daily for three days did not hasten the disappearance of *Salm. typhi-murium* from the stools of infected persons.

LEHNERT, E. (1947.) Ein Beitrag Kenntnis der Fehlerquellen bei der Brucella abortus-Agglutination. [Sources of error in *Brucella abortus* agglutination test.]—*Skand. VetTidskr.* 37. 630–660. [In German: English and Swedish summaries.] 2243

L. attributed variations in the results obtained in agglutination tests at different laboratories in Sweden to lability of bovine serum, varying agglutinability of the antigens, and also, possibly, to the age of the antigen. Insufficient accuracy in titrating the serum was also a source of error. The occurrence of high agglutination values in cattle free from brucella infection may be due to non-specific factors. Standardization of the agglutination test was desirable.—F. E. W.

LARSEN, P. H. (1950.) Opsonic indexes of cattle following injections of a *Brucella abortus* bacterin.—*Cornell Vet.* 40. 417–436. [Author's conclusions copied *verbatim*.] 2244

Following injections of killed cultures of a virulent strain of *Brucella abortus*, there was increased phagocytic activity and evidence of moderate production of serum agglutinins. According to the two tests employed, the agglutinins declined in measurability much more rapidly than the opsonins. Neither the opsonocytaphagic test alone, nor a combination of it with the serum agglutination test, served to distinguish resistant from susceptible individuals.

BOYD, D. M. & CASMAN, E. P. (1951.) **Inhibition of a strain of *Brucella abortus* by medium filtered through cotton.**—*Publ. Hlth Rep., Wash.* 66. 44–49. [Authors' summary and conclusions copied *verbatim*.] 2245

Filtration of an improved tryptose agar through 15 different commercial brands of absorbent cotton resulted in media which completely inhibited the growth of a strain of *Br. abortus*. The inhibition was due to substances extractable from cotton, which were soluble in hot water and soluble in ether after acidification with hydrochloric acid to pH 2.0. These fatty-acid-like substances completely inhibited growth of the test organism when added to the medium in the concentration of 10 mg. per liter. The unsaturated fatty acids which are found in cottonseed oil inhibited growth of the *Brucella* culture in a concentration of 1 mg. per liter; the saturated fatty acids gave partial inhibition at this concentration. The inhibition of growth could be neutralized by the addition of starch to the medium.

MARR, A. G. & WILSON, J. B. (1950.) **Genetic aspects of the added carbon dioxide requirements of *Brucella abortus*.**—*Proc. Soc. exp. Biol., N.Y.* 75. 438–440. [Authors' summary slightly modified.] 2246

The results indicate that *Br. abortus* loses its requirement for added CO<sub>2</sub> by spontaneous mutation at a rate of approximately  $3 \times 10^{-10}$  per cell division. Training of such cultures to dispense with their added CO<sub>2</sub> requirement probably consists of a selection of a spontaneously occurring mutant rather than gradual adaptation of the culture as a whole. The low mutation rate indicates a high degree of stability for CO<sub>2</sub> requirement in cultures of *Br. abortus*.

WRIGHT, E. A., MORGAN, R. S. & WRIGHT, G. P. (1950.) **Tetanus intoxication of the brain stem in rabbits.**—*J. Path. Bact.* 62. 569–583. [Authors' summary copied *verbatim*.] 2247

The intraneural injection of tetanus toxin into the facial, vagus and hypoglossal nerves of rabbits is followed about 24 hours later by a



syndrome of brain-stem tetanus whose major signs are strabismus, immobility of vibrissae, salivation, bradycardia and torticollis.

When the vagus nerve is injected with toxin, the signs develop in succession; those that depend upon innervation from motor nuclei close to the vagus centre tend to appear early in the intoxication.

The bradycardia that follows intoxication seems to be independent of reflex modification by stimulation or destruction of the aortic-depressor mechanism, and thus to be brought about by intrinsic changes in the cardio-inhibitory centre itself.

The features of brain-stem tetanus induced in this way are compatible with the view that local tetanus is essentially a result of central nervous system intoxication. They appear to be irreconcilable with Abel's hypothesis that the toxin evokes muscular spasticity through peripheral action.

EASTERBROOKS, H. L. & PLASTRIDGE, W. N. (1950.) **Intrauterine antibiotic treatment of vibronic sterility in dairy cows.**—*J. Amer. vet. med. Ass.* 117. 388. 2248

Failure to conceive after repeated service is not an uncommon occurrence in cows from herds where there has been *Vibrio fetus* infection. Five such animals were treated by infusing into the uterus either 1 g. of streptomycin alone or in conjunction with 200,000 units of penicillin. All became pregnant at the first oestrus after treatment. As an aid in the control of *V. fetus* it is suggested that 0.5 mg. streptomycin should be added to each ml. of diluted semen used in artificial insemination.—A. T. COWIE.

ÜSTÜN, T. F. (1948.) **Hatay Salgın Lenfanjit Hastalığı. [Epizootic lymphangitis in Hatay (Turkey).]**—*Türk Veteriner Hekimleri Dergisi* 18. 3-15. 2249

The disease is established in certain southern villages of Turkey. Within three years 236 cases were observed, diagnosis being made by microscopic examination of pus. The period of incubation in horses was up to 8½ months, and mention is made of spread by such indirect means as insects. The problem of local treatment is referred to in detail, but no noteworthy information is given.—S. ALPAR.

CAMPBELL, C. C. & SASLAW, S. (1951.) **Failure of streptomycin to enhance the infectivity of *Histoplasma capsulatum* in mice.**—*Publ. Hlth Rep., Wash.* 66. 16-19. 2250

Streptomycin enhances the growth of certain strains of *Histoplasma capsulatum* *in vitro*. The

authors studied the effect of streptomycin on histoplasmosis in young mice infected with varying amounts of *H. capsulatum* (yeast phase). They were given graded daily doses of streptomycin sulphate (0.05-5 mg.). Uninfected mice given similar doses of the drug and also untreated infected animals were kept as controls. The death rate of infected animals receiving streptomycin was not significantly different from that of the untreated mice. It was concluded that streptomycin did not enhance the virulence of *H. capsulatum* *in vivo*.—JOHN SEAMER.

LANJOUW, J. (1950.) **Botanical nomenclature and taxonomy.** A symposium organized by the International Union of Biological Sciences with support of UNESCO at Utrecht, the Netherlands, June 14-19, 1948.—*Chron. bot.* 12. 1-88. [Abst. in *Rev. appl. Mycol.* 29. 535. (1950), copied verbatim.] 2251

This symposium, edited by Professor J. Lanjouw, contains the minutes of the Utrecht Conference of 1948, together with a supplement to the International Rules embodying the alterations made at the Sixth International Botanical Congress, Amsterdam, 1935, compiled by T. A. Sprague. A supplement by J. Lanjouw discusses the need for an international society of plant taxonomists.

FEIGENBAUM, A. & LANDAU, J. (1948.) **Uveitis due to the Palestinian bovine strain of leptospira.**—*Acta. med. Orientalia.* 7. 115-117. [Authors' summary slightly modified.] 2252

A case of uveitis due to a Palestinian strain of bovine leptospira is presented which appeared 10 weeks after the onset of the general disease.

An agglutination test of the patient's serum performed 12 weeks after the onset of the general disease was positive up to a dilution of 1 : 2000 and three months later still up to 1 : 2000.

In cases of uveitis of obscure origin in Palestine it is suggested that the possibility of bovine leptospirosis be taken into consideration as an aetiological factor and an agglutination test be performed in addition to the routine examination.

CHESNEY, G. (1951.) ***Leptospira canicola* in a girl and her puppy.**—*Mon. Bull. Min. Hlth publ. Hlth Lab. Serv.* 10. 78-81. [Author's summary and conclusions copied verbatim.] 2253

A case of canicola fever is described. Two febrile phases occurred with a five-day remission. The illness suggested at certain stages tubercular meningitis, poliomyelitis and typhoid fever. The source of infection was a puppy that had had an illness diagnosed as "teething".



Owners of sick dogs should avoid the danger of infection from urine; licking of the face by healthy dogs is not without risk. In persons presenting obscure meningeal symptoms the possibility of meningeal leptospirosis should be borne in mind.

BISSET, K. A. & HALE, C. M. F. (1951.) The development of bacterial flagella in the germinating microcyst.—*J. gen. Microbiol.* 5. 150–154. [Authors' summary copied *verbatim*.] 2254

See also *absts.* 2453 (arctic aerobiology); 2456 (report, Kenya); 2458 (report, Netherlands); 2459 (report, Denmark); 2460 (report, Germany); 2461–2462 (reports, U.S.A.); 2463 (report, French Guiana); 2464 (book, fungi).

The microcyst stage of *Salmonella typhi*, *Proteus vulgaris*, *Bacterium coli* and *Pseudomonas fluorescens* is non-motile and devoid of flagella. Observations by electron- and photomicroscopy indicate that the flagella grow outwards through the cell wall of the germinating microcyst. They commence to develop after about 2 hr. incubation. Alike in bacteria with peritrichous and polar flagella a single, polar or sub-polar flagellum develops first. In the process of maturation the flagella are shed and the non-motile microcysts produced. Basal granules may occasionally be observed.

## DISEASES CAUSED BY PROTOZOAN PARASITES

WILSON, S. G. (1950.) A preliminary note on resistance to treatment as shown by a strain of *T. congolense* in the Bukomero district of Uganda.—*Vet. Rec.* 62. 709–711. 2255

Doses of 0.5 mg. per kg. and one mg. per kg. of antrycide dimethylsulphate failed to cure cattle infected with a field strain of *Trypanosoma congolense*. Subsequent observations indicated that the strain was resistant not only to heavy doses of antrycide but also to dimidium bromide. It is suggested that drug resistance arises through repeated retreatment of cattle with dimidium bromide at the rate of one mg. per kg.

—S. BRIAN KENDALL.

EVANS, J. T. R. (1950.) Control of bovine trypanosomiasis in the Anglo-Egyptian Sudan. [Phenanthridinium and antrycide.]—*Bur. internafr. Tsetse Tryp., Leopoldville.* Publ. No. 113/0. 2256

It was estimated in 1947 that about one and a half million cattle lived in infected areas, and that the death rate was about 10,000 per month. The infecting organism was principally *Trypanosoma congolense*, with some *T. vivax*.

During 1947–48 mass treatment, aiming at 100% and achieving over 90%, was carried out in an area of 20,000 square miles; the treatment consisted of subcutaneous injection of 1 mg. per kg. of 2% dimidium bromide (phenanthridinium 1553). Severe reactions appeared in 3–4% of cases, or in greater numbers if water and grazing were inadequate. After 12–18 months the death rate caused by the drug was estimated at more than 1%. Losses from infection were reduced to relatively negligible numbers.

In 1949, antrycide methylsulphate was administered to over 250,000 cattle, about one-

quarter of which had signs of infection. The dose was 5 mg. per kg. subcutaneously, with slightly less for young animals. Toxicity was less than with dimidium bromide. Results were spectacular. After several months there was apparently complete elimination of infection from the herds.—N. DEAN.

PIAT, B. L. (1948.) Note complémentaire sur l'emploi du bromure de dimidium (corps 1553) dans la trypanosomiase. [Phenanthridinium 1553 in treatment of trypanosomiasis in horses and cattle.]—*Bull. Serv. Elev. Industr. anim. A.O.F.* 1. pp. 16–20. 2257

In a horse weighing 250 kg. given 500 mg. of phenanthridinium 1553 (dimidium bromide) in 1% solution, intravenously, signs of severe shock developed, including dilatation of the pupils, loss of appetite and trembling. P. found that a 1% solution of phenanthridinium 1553 when filtered through filter paper and hermetically sealed in a brown glass flask, will keep its condition for up to one year. Only one dose at the rate of 2 mg. per kg. was necessary in treatment of horses, most symptoms caused by the drug disappearing within 15 min. Appetite was regained within 48 hours. The parasite causing the trypanosomiasis was always *T. vivax*.

Treatment of only one cow was described. Symptoms of short duration were quick breathing, high temperature and loss of appetite. Microscopic examination revealed a heavy infestation of *T. vivax*. Phenanthridinium 1553 in 1% solution was administered intravenously at the rate of 2 mg. per kg. In 20 hours, no parasites remained. After two days, some symptoms persisted, but three injections of novarsenobenzol cured them.—BERYL A. THURSTON.



DAUDEL. (1950.) Essais de traitement de la trypanosomiase du cheval par le bromure de dimidium. [Treatment of equine surra with dimidium bromide.]—*Rev. vét. milit.* 5. 73–79. 2258

Four cases of trypanosomiasis were described in detail and the results of treating 50 other animals are reported. In all but two, recovery in 8–10 days followed the administration of 0.002 g. per kg. dimidium bromide intravenously. Recent and prolonged infections responded equally well. Appetite returned and temperature fell after 48 hours. Later petechiae, oedema, anaemia or icterus disappeared. The symptom which persisted longest was paraesthesia of the hind limbs. There were no relapses. Two animals died as a result of treatment with the drug. *Trypanosoma vivax* was the organism involved.—N. DEAN.

RAY, H. N. (1950.) Use of stilbamidine (M & B 744) in the diagnosis of latent trypanosomiasis in bovines.—*Sci. Cult.* 16. 33–34. 2259

A simple and rapid method for the detection of latent surra (*Trypanosoma evansi*) infection in cattle was described which compared favourably with both the allergic and the complement fixation tests. The method was as follows:—a freshly prepared 10% aqueous solution of stilbamidine (M & B 744) is added in 0.5 ml. volumes to agglutination tubes. One drop of fresh suspected bovine serum (separated from the clot 48 hours previously and inactivated at 55°–56° C.) was released above the surface of the solution in the tube. A positive reaction was denoted when the drop immediately coagulated and sank to the bottom of the tube in a single large mass and dissolved in 5–10 min. (+++), or when the coagulum sank in large lumps (++) or in small shreds (+) and these slowly dissolved. A negative reaction (O) was indicated when the coagulum floated, formed a ring at the surface and quickly dissolved within two min.

Blood sera of cattle infected with other blood protozoa (*Babesia bigemina* and *Theileria annulata* or both) and with rinderpest virus behaved negatively. The sera of horses and mules infected with *T. evansi* also gave negative reaction while buffalo serum gave inconclusive results.—FERGUS S. McCULLOUGH.

LE ROUZIC. (1949.) Nouveaux trypanocides en expérimentation. [New trypanocides under investigation.]—*Bull. Méd. l'Afrique Occidentale Française*. Spéc. pp. 63–73. [Abst. in *Trop. Dis. Bull.* 47. 449. (1950.)] 2260

Pentavalent arsenical compounds are trypanocidal after reduction to their trivalent forms,

but the latter are more toxic than the former. The toxicity of the trivalent melarsen oxide (melox) was reduced by combining it with B.A.L. (British anti-lewisite), the resultant product being called melarsen B.A.L. or mel B. B.A.L. was also combined with the trivalent derivatives of other pentavalent arsenical compounds such as tryparsamide, stovarsol and carbarsone.

Conjugated compounds of this type have high trypanocidal activity and diminished toxicity with increased ability to improve the cerebrospinal fluid picture.

Field trials were carried out with mel B by Le Rouzic (1949), and by a mel B Commission (1949). Both agree that mel B is more toxic than lomidine (a French variant of pentamidine). Of the two drugs lomidine appeared to be more effective in the first stage of the disease and mel B in the second stage.

—J. H. ROSE.

WIIDIK, R. W. (1948.) Colitis coccidiosa beim Rind in Finland. [Coccidiosis in cattle in Finland.]—*Suom. Eläinlääkäril.* 54. 181–188. 2261

A short review of coccidiosis in cattle. The disease is spread at pasture during the summer. The diagnosis is based upon microscopic tests. The disease has not increased in importance, although in some parts of the country about 18% of the calves are infected. Deaths are rare and occur only among calves. The infectious agent in Finland is found to be *Eimeria smithi*. Arsenic trioxide and ichthargan (a compound of silver and ichthyolsulphonic acid) given *per os* are of value but phenothiazine is ineffective.—H. WESTERMARCK.

PETERSON, E. H. & HYMAS, T. A. (1950.) Sulphaquinoxaline, nitrofurazone, and nitrophenide in the prophylaxis of experimental *Eimeria necatrix* infection.—*Amer. J. vet. Res.* 11. 278–283. 2262

The effects of sulphaquinoxaline, nitrofurazone and nitrophenide in the treatment of experimentally induced coccidiosis caused by *Eimeria necatrix* were discussed. The maximum prophylactic benefit was obtained by the administration of 0.03% sulphaquinoxaline in the drinking water not later than 24 hours following infection and continued for a minimum of five or six days.

Death losses were significantly reduced by the use of 0.005–0.03% of nitrofurazone in the mash but at levels of 0.04–0.05% this drug proved toxic.

Complete suppression of mortality was achieved with nitrophenide only at a level of



0.05% in the mash, but this amount approached the limit of tolerance.

A pure culture of *E. necatrix* induced a disease very similar to that of *E. tenella*. The disease was markedly acute, clinical manifestations occurring abruptly on the fifth day after infection and subsiding after the sixth or seventh days. Actual recovery from clinical disease was, however, more protracted.—S. BRIAN KENDALL.

SMITH, B. F. & MCSHAN, W. H. (1949.) The effect of the protozoan parasite, *Eimeria stiedae*, on the succinic dehydrogenase activity of liver tissue of rabbits.—*Ann. N.Y. Acad. Sci.* 52. 496–500. [Authors' summary copied verbatim.] 2263

New Zealand white rabbits were infected with *Eimeria stiedae*, and the infection was allowed to progress for 5, 10, 15, and 20 days. Animals were sacrificed at these times and the succinic dehydrogenase activity of their liver tissue was determined. The activity is expressed in terms of  $QO_2$ , i.e., the  $mm^3$  of oxygen consumed per mg. of dry tissue per hour. The percentage of dry weight in terms of fresh weight of liver was 31 for normal animals, and 30, 27.5, 22.9 and 18.7 respectively for animals infected for 5, 10, 15, and 20 days. According to these dry weight percentages, the liver was slightly edematous after 10 days, and more so after 15 days, with this condition reaching its maximum after 20 days of infection. The activity of the dehydrogenase expressed as  $QO_2$  was 74.0 and 60.9 respectively after 10 and 15 days of infection, as compared to 46.2 and 45.5 respectively for normal and 5-day-infected animals. The  $QO_2$  was 50.0 after 20 days, which was at the time of heaviest infection.

On the basis of the data presented, the conclusion seems warranted that the early stages of the life cycle of *E. stiedae* (schizogony and gametogony) elicit an increase in the succinic dehydrogenase activity of the liver of rabbits and that this high level of activity decreases as the infection approaches the 20th day. The results are discussed and two possible explanations are suggested for the increased succinic dehydrogenase activity of liver after 10 and 15 days of infection as compared to liver of normal and 5-day-infected animals.

PICK, F. (1950.) Sur l'étiologie de la péri-cardite exsudative de la poule domestique au cours du paludisme expérimental à *Plasmodium gallinaceum* Brumpt 1935. [Exudative pericarditis in *Plasmodium gallinaceum* infection in fowls.]—*Bull. Soc. Path. exot.* 43. 544–545 2264

The author suggests that the exudative pericarditis seen in fowls which have died following infection with *Pl. gallinaceum* is secondary to the original blood stream infection with the parasite. He found the condition in fowls which survived up to 71 days after having undergone only a mild attack.—D. LUKE.

BEN-HAREL, S. (1951.) The phagocytic activity against *Plasmodium lophurae* of macrophages from ducks of varying degrees of natural resistance to this parasite.—*Amer. J. Hyg.* 53. 1–10. [Author's summary copied verbatim.] 2265

Macrophages grown from resistant ducks showed as high a phagocytic activity toward *Plasmodium lophurae* in their own serum as in a hyperimmune serum. Macrophages from non-resistant ducks showed slightly less phagocytosis in the presence of an homologous serum than in a hyperimmune serum. In one experiment, macrophages from a resistant duck remained entirely inactive when serum from a young duckling was used.

DEDASHEV, Y. P. (1949.) [Acaprin in treatment of *Babesia* infection in horses.]—*Veterinariya, Moscow.* 26. No. 4. pp. 18–19. 2266

Acaprin (piroplasmin) was injected subcutaneously, either in the neck or caudally, into ten spontaneously infected horses in two doses of 0.006 ml. per kg. body weight at an interval of six hours. There were increases in temperature, pulse rate, peristalsis and defaecation, with neutrophilia and lymphopenia. Following the second dose conditions returned to normal after 6–20 hours in the case of caudal injections, and after 16–45 hours in the case of neck injections. The blood was also clear of parasites. D. states that an increase of the dose one-and-a-half times causes toxic effects. Details of each of the ten horses are given in a table, as well as of two cases of induced infection.—F.A.A.

BONSER, G. M. (1950.) Fatal intussusception of the canine caecum associated with the presence of toxoplasma in the circular muscle of the ileum.—*J. Path. Bact.* 62. 650–653. [Author's summary copied verbatim.] 2267

A fatal case of intussusception of the caecum into the colon in a 3-year-old bitch, causing subacute intestinal obstruction, is described. Pseudocysts resembling those of *Toxoplasma* were found in the circular muscular coat of the ileum at some distance proximal to the ileo-colic valve. It is thought that the presence of these parasites may have been the cause of irregular peristalsis, resulting in intussusception.



SENECA, H. & HENDERSON, E. (1951.) **Growth of hemoflagellates in dialyzing sacs and the production of growth inhibitory factor.**—*Amer. J. Hyg.* 53: 17–21. [Authors' summary and conclusion copied *verbatim*.] 2268  
Abundant growth of hemoflagellates can be

obtained by growing them in dialyzing (cellulose) sacs. From these cultures, a soluble and dialyzable factor is obtained which inhibits the growth of the homologous organism, but has little effect on the heterologous hemoflagellates.

See also absts. 2384 (holotrich ciliates); 2456 (report, Kenya); 2458 (report, Netherlands); 2459 (report, Denmark); 2460 (report, Germany).

## DISEASES CAUSED BY VIRUSES AND RICKETTSIA

DE PAOLI, P. (1947.) **La polizia sanitaria nella lotta contro la rabbia. [Sanitary police measures for the control of rabies.]**—*Zooprofilassi*. 2. No. 6. pp. 6–14. 2269

A discussion of the control of rabies on conventional lines.—R. MACGREGOR.

TENBROECK, C. (1950.) **Prevention of street virus infection by vaccine.**—*Proc. Soc. exp. Biol., N.Y.* 75: 528–531. [Author's summary copied *verbatim*.] 2270

Guinea pigs inoculated intramuscularly with street virus can be protected by mustard inactivated fixed virus injected at the same time or 24 hours later, provided the virus has a high immunizing titer. These results give experimental proof that vaccine will protect after infection and also provide a test that could be used in evaluating vaccines for human use. If non-protecting amounts of vaccine or fixed virus are injected, the incubation period may be shorter and the death rate slightly higher than in the control animals receiving only street virus.

TENBROECK, C. & HERRIOTT, R. M. (1950.) **Mustard inactivated rabies vaccine.**—*Proc. Soc. exp. Biol., N.Y.* 75: 523–528. [Authors' summary slightly modified.] 2271

Mustard gas added to brain suspensions from animals infected with fixed virus gives a vaccine which by the method of testing used is (a) better than that produced when such brain suspensions are inactivated with phenol, (b) about equal to that when the inactivation is produced by ultraviolet light, and (c) almost as good as active fixed virus. The vaccine is very stable at refrigerator temperatures, and the method of preparation is simple and requires no unusual laboratory equipment.

BURNET, F. M. (1951.) **A genetic approach to variation in influenza viruses. I. The characters of three substrains of influenza virus A. (WS).**—*J. gen. Microbiol.* 5: 46–53. [Author's summary copied *verbatim*.] 2272

The three virus types derived from the classical WS strain of influenza virus can be

distinguished by a relatively wide range of 'marker' characters, which are available for the recognition of virus characteristics in studies of variation and recombination. Despite their common origin the three WS strains have diverged very markedly one from another. Each has unique characteristics: NWS its absence of enzymic and indicator activity, its neurotropism; WSE its firm non-eluting adsorption to red cells; WSM its extremely heat-resistant haemagglutinin. From the point of view of the general pathology of virus infection the neurotropic character imposed on an influenza virus is the most important of the variant qualities.

BURNET, F. M. & LIND, P. E. (1951.) **A genetic approach to variation in influenza viruses. 3. Recombination of characters in influenza virus strains used in mixed infections.**—*J. gen. Microbiol.* 5: 59–66. [Authors' summary copied *verbatim*.] 2273

When the non-encephalitogenic strain of influenza virus A, WSM, was mixed with the influenza strain NWS in suitable proportion no encephalitis followed intracerebral injection of the mixture in mice. When the amount of WSM relative to NWS was decreased partial interference resulted and from four mice so inoculated, virus strains referred to as WS-NM were isolated, which appear to be recombinants. The NM strains were encephalitogenic for mice, though in varying degree, their haemagglutinin was almost as resistant to heat inactivation as that of WSM and they had at least one character (position in the receptor gradient) in which they differed from both the original strains.

RASMUSSEN, A. F., Jr. & STOKES, J. C. (1951.) **Chemical inhibition of the growth of the virus of influenza in embryonated eggs.**—*J. Immunol.* 66: 237–247. [Authors' summary copied *verbatim*.] 2274

Nitroakridin 3582 [2,3-dimethoxy-6-nitro-9 (diethyl-amino-hydroxy-propyl-amino) acridine-dihydrochloride] the related compound, rutenal, [an arsenical derivative], 2 nitro 5 aminoacridine, and cobaltous salts retarded and,



in some instances, prevented the growth of small inocula of the viruses of influenza in embryonated eggs. In the case of nitroakridin, the most active compound in this respect, the inhibitory effect was most marked during the early phases of viral growth. Nitroakridin exerted little antiviral activity *in vitro* and it is suggested that the observed effect on viral growth was secondary to the effect of nitroakridin on the embryonated egg. Nitroakridin 3582 had no chemo-therapeutic effect on infections with the viruses of influenza in mice.

FREYMAN, M. W., TAMM, I. & GREEN, R. H. (1951.) Growth curves of influenza virus based on hemagglutination titers in individual embryonated eggs.—*Yale J. Biol. Med.* 23. 269–276. [Authors' summary copied *verbatim*.] 2275

A selection of growth curves based on serial hemagglutination titers of allantoic fluids from individual eggs infected with the PR8 strain of influenza A virus is presented. A rapid rise in titer appears to be interrupted in many curves by a single plateau, and in occasional curves by two plateaus. The interval between terminations of successive plateaus usually approximates 4 to 5 hours. Decreasing the dose of virus results in a prolongation of the time before appearance of detectable hemagglutinin in the allantoic fluid and in an increase in the variability of this lag period and of the contour of the growth curve. A prolongation of the lag period, without marked change in the contour of the curves, appears when 12-day rather than 10-day eggs are used. Some aspects of the technique used are discussed.

BURNS, K. F. (1950.) Congenital Japanese B encephalitis infection of swine.—*Proc. Soc. exp. Biol., N.Y.* 75. 621–625. [Author's summary copied *verbatim*.] 2276

A congenital disease of swine is reported which results in stillbirth or death during the neonatal period. The chief pathologic changes are those of a nonbacterial encephalitis. This disease showed a temporal relationship to epidemics and equine epizootics of Japanese B encephalitis. A virus identified as that of Japanese B encephalitis was recovered from the brain of 3 piglets which died 48 to 72 hours after birth. Congenital damage of the nervous system by an arthropod-borne encephalitis virus has thus been demonstrated in swine.

McGOVERN, V. J., STEEL, J. D., WYKE, B. D. & DODSON, M. E. (1950.) Canine encephalitis causing a syndrome characterized by tremor.—*Aust. J. exp. Biol. med. Sci.* 28. 433–447. [Authors' summary copied *verbatim*.] 2277

A study has been made of an encephalitis in dogs characterized clinically by tremor and resembling the human tremor-rigidity syndrome in many respects. This encephalitis has been described from the clinical and pathological aspects. It is frequently associated with previous clinical distemper. The pathological changes are those of a meningo-encephalo-myelitis in which nuclear inclusions are present within the glial cells.

The lesions constantly present in acute cases are those of focal demyelination in the cerebellum and neuronal degeneration in the motor and premotor cortex. Other characteristic but not constant lesions are subpial demyelination of the brainstem and focal demyelination in any portion of the brain.

Residual lesions in the brains of dogs that have survived the encephalitic process and in which the clinical signs are static, consist of thickening of the smaller arterioles, degeneration of the pyramidal cells of the premotor and motor cortex and scattered minor residua throughout the brain.

GILMAN, A. R. (1951.) The hematological response of the horse to the virus of equine infectious anemia.—*Vet. Ext. Quart. Univ. Pa.* 51. 44–55. [Author's summary modified.] 2278

A hematologic study of five horses experimentally infected is presented. Characteristically there is a primary fall of erythrocytes, hemoglobin, and red cell volume somewhere between the second and fifth day of experimental infection. That is followed in the next few days with recovery of about one-half of this loss. Then, between the tenth and twelfth days there is a further fall of erythrocytes, hemoglobin and red cell volume. This is accompanied by a rise in temperature in most cases above 102° F. At this point, the animal shows an average decrease of 2,500,000 erythrocytes/cu. mm., 4.3 grams % of hemoglobin, and 11.4% in red cell volume.

Later changes are dependent upon whether the animal continues as an acute case with extreme changes in the blood picture and recurrent temperature rises, or whether it slips into the subacute stage with minor temperature excursions and less extreme blood changes. The chronic carrier state is characterized by a normal blood picture and a normal temperature for long periods of time.

The enormous changes in sedimentation rates observed were the result of changes in red cell volume. When these rates were corrected to a red cell volume of 42%, no real change in sedimentation rate existed during any stage of the disease.



The mean values for corpuscular hemoglobin (M.C.H.), corpuscular volume (M.C.V.), and corpuscular hemoglobin concentration (M.C.H.C.) were calculated and revealed no significant changes during the course of this disease. Blood smears stained with Wright's stain show the erythrocytes to be normal in size, shape, and staining quality. From this it must be concluded that the quantity of hemoglobin per cell remains fairly constant regardless of the changes that may take place in red cell numbers. The anemia, when it exists, is of the normocytic, normochromic, hypocythemc type.

PETEK, M. (1948.) Aborto equino da ultravirus. [Virus abortion in mares.]—*Zooprofilassi*. 3. No. 11. pp. 7-10. 2279

A discussion of the literature containing no new work.—K. SLAVIN.

RANDALL, C. C., MCVICKAR, D. L. & DOLL, E. R. (1950.) A complement fixation test for equine virus abortion.—*Proc. Soc. exp. Biol., N.Y.* 75. 465-468. [Authors' conclusions and summary slightly modified.] 2280

The complement-fixation test described provides a means whereby the presence of antibodies to the virus of equine virus abortion (E.V.A.) can be detected and quantitatively estimated in serum. The lung antigen employed in the test is specific in the sense that it does not react with sera from normal horses, and that similarly prepared antigen from the lungs of a normal horse does not react with positive sera. (Whether or not the antigen will react with antibodies to other viruses, and whether or not different strains of this virus exist, remain to be investigated.) By means of this test information may now be obtained on the immunological course of E.V.A. in diseased mares, which will perhaps help in early diagnosis and in prognosis. The response of 2 horses to single injections of infected material has revealed the potent antigenicity of the preparations. The possibilities of prophylactic immunizations, using the complement-fixation test to check the progress of the immunization, are obvious. Lastly, the test may be employed as a means of determining the presence or absence of the virus, whether in the natural host, experimentally infected animals, or inoculated tissue cultures. Experiments are in progress on an evaluation of the complement-fixation test, as employed for these purposes.

VITTOZ, R. (1948.) La peste bovine dans l'Asie des moussons. [Rinderpest in the monsoon areas of Asia.]—*Bull. Off. internat. Epiz.* 30. 12-31. 2281

The distribution of rinderpest in Asia was described. Epizootics are influenced by conditions of rearing and monsoon seasons. Periodic commercial movements of animals occur during the dry season over a wide area. Resistance is lowered by the journey and animals are put to work on arrival which usually coincides with the beginning of a monsoon. Losses are aggravated by piroplasmoses, surra and coccidiosis and in some areas by pasteurellosis. There is a breed susceptibility, European and Himalayan hill-cattle being the most susceptible. Sheep and goats tend to keep apart from cattle and are relatively less susceptible. Epizootics appear in 3½-year cycles. A programme of eradication was outlined comprising the usual classical methods. The results of immunization with various methods in various countries are described, with emphasis on the goat-adapted virus. In Asia it is felt that the most convenient method is a formalized tissue vaccine adsorbed on aluminium hydroxide. No single method of vaccination is advocated, the method used must vary with local conditions.

The role to be played by a regional International Office of Epizootics (Office International des Epizooties) in Asia is suggested.

—G. V. LAUGIER.

STENIUS, P. I. (1947.) Något om överföringsförsök och förekomsten av inklusioner i det centrala nervsystemet vid bovin elakartad katarralfeber. [Experimental transmission and the occurrence of inclusion bodies in the central nervous system in malignant catarrhal fever of cattle.]—*Skand. VetTidskr.* 37. 65-84. [English summary.] 2282

A preliminary report. S. transmitted the disease experimentally to three out of four sheep, using unfiltered bacteria-free organ suspension and defibrinated blood from two spontaneous cases in Finnish cattle, the material being injected subcutaneously and intravenously twice at a seven-day interval. A heifer inoculated intravenously with 20 ml. of blood from one of the infected sheep one month after recovery from infection and subcutaneously with 100 ml. of blood from the same animal (direct transfusion), developed a high temperature (40° C.), anorexia, dyspnoea, and somnolence, but recovered. It was slaughtered and examined P.M. and the microscopic lesions were recorded in detail and photomicrographs are included. Another heifer directly transfused with 80 ml. of blood from this animal at the height of the fever remained healthy.

S. concluded that under certain circumstances sheep may be carriers of the infection.

—F. E. W.



WILSON, D. R., ANDERSON, R. D. & SMITH, W. (1950.) *Studies in scrapie*.—*J. comp. Path.* 60. 267–282. [Authors' summary copied *verbatim*.] 2283

Scrapie occurring in certain Scottish sheep stocks is an infective disease caused by a filtrable virus of undetermined size. The disease is transmissible in series from sheep to sheep; in the present investigation nine successful passages have been made. In some instances, the incubation period of the experimental disease, resulting from intracerebral inoculation, was approximately four months, but usually it was about five months.

The virus remains viable in the desiccated state at 0° to 4° C. for long periods; in each of two experiments virus survived in dried brain tissue for a period of over two years.

In addition to a slight and variable degree of vacuolation of the neurons in the medulla oblongata the histological changes observed in the central nervous system of sheep experimentally infected were indicative of the existence of subacute or chronic meningoencephalitis.

HODGSON-JONES, I. S. (1951.) *Orf in London*.—*Brit. med. J.* April 14th. 795–796. [Author's summary copied *verbatim*.] 2284

Eight cases of orf are described. All occurred in London—six in meat porters, one in a butcher, and one in a housewife. All had handled sheep's heads which came from areas of Scotland where orf is known to be enzootic. The natural course is five to eight weeks, and was not found to be altered by the treatment given.

LLOYD, G. M., MACDONALD, A. & GLOVER, R. E. (1951.) *Human infection with the virus of contagious pustular dermatitis*.—*Lancet*. 260. 720–721. [Authors' summary copied *verbatim*.] 2285

A case of natural transmission of the virus of ovine contagious pustular dermatitis to man is described. The diagnosis was confirmed by infecting a sheep with the human material and by cross-immunity tests.

BELL, W. B. (1950.) *Passage of hog cholera virus in rabbits*.—*Virginia J. Sci.* 1. 107–110. [Abst. in *Biol. Abstr.* 24. 26. (1950), copied *verbatim*. Signed: AUTHOR.] 2286

The hog cholera virus was passed from pig to rabbit for 6 intermittent rabbit passages and then serially in rabbits for 5 passages. Attempts to pass the virus to the 6th rabbit in series failed. No febrile response or other symptoms were observed in the rabbits that could be attributed to the virus. Blood taken the 3rd day after

inoculation from one rabbit infected a pig, but blood taken the 14th day was noninfective.

EADS, F. E. (1951.) *The parenteral use of penicillin and streptomycin in complications of distemper*.—*N. Amer. Vet.* 32. 32–36. [Author's summary copied *verbatim*.] 2287

Amorphous penicillin was an effective agent in controlling the secondary invaders of canine distemper when administered at the rate of 1,000 to 1,500 units per pound of body weight four to six times per day. Streptomycin showed little, if any, value in the treatment of canine distemper even when administered at the rate of 11,000 S units per pound of body weight four times per day for ten days. Amorphous penicillin can be safely administered six times daily for 26 days with no untoward effects other than irritation at time of injection. Both amorphous penicillin and streptomycin are quite irritating when injected into the dog and cat. Streptomycin was an effective antibiotic in the treatment of 30 of 34 cases (88.2 per cent) of infectious feline enteritis when administered at the rate of 0.2 to 0.25 Gm in a single daily injection. No undesirable effects other than irritation were observed in dogs and cats when streptomycin was administered once daily for eight days.

BODIN, S. (1947.) *Några erfarenheter av ympning mot valpsjuka med simultanympämne enligt Laidlaw-Dunkin och ympämne enligt Green*. [Experiments in canine distemper vaccination using Laidlaw-Dunkin's virus serum and Green's vaccine].—*Skand VetTidskr.* 37. 696–715. [English summary.] 2288

In the course of a year 2,000 doses of Laidlaw-Dunkin simultaneous vaccine and 1,400 doses of Green's vaccine were sent out from the Swedish State Institute of Veterinary Medicine accompanied by questionnaire forms so that an investigation of results could be made in order to compare the two methods. Replies were received in 464 and 380 cases respectively.

Of the 464 reported vaccinations by the Laidlaw-Dunkin method, 23 dogs developed inoculation distemper and 14 died. Of the 380 vaccinated by Green's method 15 developed inoculation distemper and 10 died. In the first group 30 dogs contracted distemper in spite of vaccination, with ten deaths; in the second group only one contracted distemper and recovered. The immunity conferred by Green's vaccine was therefore significantly superior.

B. found a correlation between the incidence of spontaneous cases of dog distemper and the incidence of inoculation distemper and considers that extensive vaccination should be carried out



during periods when there is a low incidence of distemper (in Sweden, from Jan.-July).

—F. E. W.

DOLL, E. R., MCCOLLUM, W. H. & WALLACE, M. E. (1951.) The effect of virus quantity and dilution procedure upon the hemagglutination inhibition test for Newcastle disease diagnosis. —*Poult. Sci.* 30. 67-69. [Authors' summary copied *verbatim*.] 2289

A comparative study of virus quantity in the HI test for Newcastle disease diagnosis failed to show a quantitative relationship between 5 and 10 HA units of virus. Differences in HI titers obtained with the two concentrations of virus appeared to be within the limits of variation for the testing procedure. A comparison of serial dilution of serum in saline using a ten minute incubation period for the serum-virus mixture with serial dilution of serum in the red cell suspension resulted in 89% agreement in the selection of positive individuals having HI titers ranging from 1:10 to 1:5,120. The procedure employing dilution of serum in the red cell suspension was approximately 40% efficient in selecting individuals giving positive reactions at serum dilutions 1:10 or 1:20 in the saline dilution procedure with ten minutes serum-virus incubation. The lower titers obtained by dilution of the serum in the red cell suspension appeared to result from the absence of a serum-virus incubation period.

HILL, A. B. & KNOWELDEN, J. (1950.) Inoculation and poliomyelitis. A statistical investigation in England and Wales in 1949.—*Brit. med. J.* July 1st. 1-6. 2290

The records of 410 children under five years old affected with poliomyelitis were collected from 33 areas with a high incidence of the disease. In 164 cases it was possible to pair the patients with closely corresponding controls. It was concluded that children inoculated with A.P.T. or mixed A.P.T. and pertussis vaccines developed paralysis more frequently than children not so inoculated. The paralysis tended to follow 1-3 weeks after inoculation and to be present in the inoculated limb.—K. G. TOWERS.

MEENAN, P. N. (1951.) Late infectivity in hepatitis.—*Lancet*. 260. 447-448. [Author's summary copied *verbatim*.] 2291

A nurse transmitted infective hepatitis on the thirteenth day of illness to her mother, aged 63. The incubation period in the second case was thirty-two days. It is suggested that the usual fourteen days' isolation should be regarded as a minimum rather than a maximum period.

LURIA, S. E. (1950.) Bacteriophage: an essay in virus reproduction.—*Science* III. 507-511. 2292

No new work was reported, but a mechanism of virus reproduction was postulated from the experimental evidence available from studies of phage-bacteria relationship. This picture is admittedly very incomplete and how far it can be applied to other virus infections is not known. Certain similarities, however, can be traced and methods for the next stages of investigation were suggested.—K. G. TOWERS.

LENNETTE, E. H., MEIKLEJOHN, G. & THELEN, H. M. (1948.) Treatment of Q fever in man with aureomycin.—*Ann. N.Y. Acad. Sci.* 51. 331-342. [Authors' summary copied *verbatim*.] 2293

Results of aureomycin therapy of 19 Q fever patients are presented. The results in a group of 4 patients treated by the intramuscular route with small doses were not considered satisfactory. Of the remaining 15 patients, all treated orally, improvement occurred in 14 relatively promptly after commencement of therapy. The fifteenth patient, classified as a chronic case of Q fever, failed to respond even to large doses of the drug. Relapses occurred in 2 patients in the orally-treated group following cessation of therapy. However, both patients became, and remained, afebrile following a second course of aureomycin. It is concluded that oral aureomycin therapy offers considerable promise in the treatment of Q fever and that further investigations are desirable to evaluate the usefulness of the drug.

ANON. (1948.) Chloromycetin in rickettsial infections.—*Lancet*. 254. 953-954. 2294

This annotation deals with the efficacy of chloromycetin in the laboratory against *Rickettsia prowazeki* in chick embryos and against *R. tsutsugamushi* infections in 25 patients. The chloromycetin was given by mouth up to a total of 6 g. and reduced the mean duration of fever from 18.1-7.5 days.—MALCOLM WOODBINE.

WONG, S. C. & COX, H. R. (1948.) Action of aureomycin against experimental rickettsial and viral infections.—*Ann. N.Y. Acad. Sci.* 51. 290-305. [A'bst. from authors' summary.] 2295

Aureomycin has marked therapeutic activity against the viruses of the psittacosis-lymphogranuloma group and rickettsiae of the spotted fever, typhus fever, scrub typhus fever and Q fever groups in embryonated hens' eggs, mice, and guinea pigs. It has no apparent *in vitro* activity.



If guinea pigs receive a massive dose of infectious material and then are treated with aureomycin before symptoms appear, no fever or other signs of illness develop, but anti-bodies in measurable degree are induced, and the animals are immune on subsequent rechallenge. On the other hand, if guinea pigs receive relatively small doses of infectious material and then are treated with aureomycin before symptoms appear, no fever or other signs of illness develop, nor do antibodies always appear, and the animals may or may not be immune on rechallenge.

Aureomycin shows marked therapeutic activity orally, as well as parenterally, for mice infected intraperitoneally or intracerebrally with psittacosis or lymphogranuloma venereum viruses, or for mice infected intravenously or intranasally with rickettsialpox or murine typhus.

The question as to whether treatment with aureomycin frees the tissues of the host from the infectious agent arises. Mice infected with large doses of psittacosis or lymphogranuloma venereum viruses and surviving following treatment with aureomycin were found to harbour the infectious agent in their liver and brain, respectively, when sacrificed on the 17th day post

infection. However, animals similarly infected and treated were found to be free of the infectious agent when tested on the 42nd day. In contrast, control animals infected with relatively small, nonfatal doses showed the infectious agent in their tissues at least through the 42nd day.

Aureomycin failed to show any therapeutic activity against the following viral infections: B strain of influenza, canine distemper, rabies, Newcastle disease, Venezuelan equine encephalomyelitis, and MEF-1 strain of poliomyelitis.

GORDON, M. H. (1948.) **Inactivation of viruses by heat.** [Correspondence.]—*Brit. med. J.* Dec. 11th. 1034. 2296

Vaccinia virus suspended in broth in the usual way is inactivated by an exposure of 30 min. at 65° C. If it is dried, powdered and resuspended in broth a temperature of 80° C. for the same period is necessary for inactivation. G. suggested that this can assist the transmission of prophylactic material in tropical countries and permits heating to 65° C. for 30 min. prior to issue, as a safeguard against infection with tubercle bacilli.—K. G. TOWERS.

See also absts. 2241 (Q fever); 2456 (report, Kenya); 2457 (report, East Africa); 2458 (report, Netherlands); 2459 (report, Denmark); 2460 (report, Germany); 2461 (report, U.S.A.).

## IMMUNITY

STANLEY, N. F. (1950.) **The augmenting action of lecithin and the lipoids of *Aspergillus fumigatus* and *Listeria monocytogenes* in antibody production using *Salmonella typhi-murium* as an antigen.**—*Aust. J. exp. Biol. med. Sci.* 28. 109–115. [Author's summary slightly modified.] 2297

Using *S. typhi-murium* vaccine as antigen it was demonstrated that lipid material from *Erysipelothrix (Listeria) monocytogenes* or *Aspergillus fumigatus* could act as "adjuvants" in antibody production after intradermal inocula-

tion similar to that described by Freund. Increased antibody titre resulted if the vaccine was given intravenously (1) when the lipid was mixed with vaccine prior to administration or (2) given independently by the intravenous or intraperitoneal route. Augmentation of antibody titre may be associated in some way with the stimulation of monocytes as lipid material incapable of increasing the number of circulating monocytes failed to augment antibody titre. Lecithin, the only non-microbial lipid tested stimulated the production of both monocytes and antibodies.

See also absts. 2235 (natural immunity against diphtheria in horses); 2236 (mallein); 2243 (*Br. abortus* agglutination); 2244 (opsonic index after *Br. abortus* bacterin injections); 2270–2271 (rabies vaccines); 2280 (complement-fixation test for equine virus abortion); 2288 (distemper); 2289 (Newcastle disease).

## PARASITES IN RELATION TO DISEASE [ARTHROPODS]

SCOTT, M. T. (1950.) **Observations on the bionomics of *Linognathus pedalis*.**—*Aust. J. agric. Res.* 1. 465–470. [Author's summary copied verbatim.] 2298

Studies on the life cycle and on populations of *Linognathus pedalis* are described.

The incubation period of the egg is 17 days, followed by three nymphal instars, each of approximately 7 days, and a preoviposition

period of 5 days. The period from egg to egg is, therefore, approximately 43 days. The female deposits approximately one egg per day.

There is a pronounced seasonal fluctuation in populations, which reach a maximum from July to October and a minimum from December to March.

Lambs are most susceptible to *L. pedalis* and may become infested within a few hours after



birth. Infestations may be acquired either by direct contact with infested sheep or from an infested environment.

Under suitable conditions of temperature and humidity, *L. pedalis* can survive for up to 18 days away from the sheep, and it has been shown experimentally that lambs can become infested from pastures at least three days after removal of infested sheep.

LAAKE, E. W. (1949.) **Livestock parasite control investigations and demonstrations in Brazil**—*J. econ. Ent.* **42**, 276–280. 2299

Ectoparasites, especially *Dermatobia hominis* and *Boophilus annulatus* var. *microplus*, but also *Haematopinus tuberculatus*, mosquitoes, *Tabanus* spp., *Musca domestica*, *Stomoxys calcitrans*, *Siphona* (*Lyperosia*) *irritans* and *Cochliomyia* cause great losses to the Brazilian cattle industry. Dipping the animals in solutions of arsenious oxide (concentration not stated) at 15-day intervals does not prevent heavy infestation by ticks.

In a series of trials arranged by the American International Association for Economic & Social Development, toxaphene, D.D.T., and benzene hexachloride were tested against *B. annulatus*, control cattle being treated with standard arsenical dips. All test materials were found to be superior to the arsenic baths, and toxaphene proved to be better than D.D.T. or benzene hexachloride when used at the same concentration. Methods tried for killing *Dermatobia* larvae were ineffective but spraying premises with toxaphene, D.D.T., or benzene hexachloride decreased the population of flies which might be expected to carry *Dermatobia* eggs. L. concludes that *Dermatobia* larvae are "undoubtedly the most serious and damaging parasite of cattle in Central and South America".

—G. B. S. HEATH.

WATERHOUSE, D. F. & PARAMONOV, S. J. (1950.) **The status of the two species of *Lucilia* (Diptera, Calliphoridae) attacking sheep in Australia.**—*Aust. J. sci. Res. Ser. B.* **3**, 310–336. [Authors' summary copied verbatim.] 2300

Evidence presented demonstrates that *L. cuprina* and *L. sericata* are distinct species. A number of characters previously unrecognized are described whereby larvae and both sexes of adults of the two species may be recognized without difficulty. The geographical distribution of the two species is different, as is also their habitat preference and their degree of attraction to living sheep. Furthermore, hybridization experiments indicate that there is great difficulty in obtaining successful matings. *L. cuprina* is the principal Australian sheep blowfly, whereas

*L. sericata* is comparatively rare in sheep-raising country and does little damage. There are two subspecies of *L. cuprina*, one from the Oriental and American regions (*L. cuprina cuprina*) and one from the African and Australian regions (*L. cuprina dorsalis*).

BUSVINE, J. R. (1950.) **A method of injecting insects with minute doses of insecticides.**—*Trans. R. Soc. trop. Med. Hyg.* **44**, 6. 2301

A micrometer syringe fitted with a needle of 0.3 mm. diameter was used to inject insecticides into the haemocoel of D.D.T.-resistant and ordinary house-flies. 0.16 ml. of liquid was injected for each small division on the micrometer. By varying the concentration of insecticide, dosage-mortality curves could be obtained.—JAS. G. O'SULLIVAN.

PIMENTEL, D. & DEWEY, J. E. (1950.) **Laboratory tests with house flies and house fly larvae resistant to D.D.T.**—*J. econ. Ent.* **43**, 105. 2302

A field strain of adult *Musca domestica* was found to be seven times as resistant to D.D.T. as a laboratory strain although this resistance was lost when the field flies were not exposed to D.D.T. for 10 generations. The authors found that there was a similar difference in resistance between the larvae of the two strains. Ten 3-day larvae of each strain were exposed to 0.001% D.D.T. in their food. The tests were repeated eight times and mortality counts were made after 72 hours. There was a 46% mortality amongst larvae of the field strain as against 84% of those of the laboratory strain. This difference was found to be statistically significant.

—M. J. LETHBRIDGE.

DENNING, D. G. & PFADT, R. E. (1950.) **Evaluation of certain insecticides in horn fly control.**—*J. econ. Ent.* **43**, 557–558. [Authors' summary slightly amended.] 2303

Satisfactory protection of cattle from *Siphona* (*Lyperosia*) *irritans* was obtained with D.D.T., methoxychlor, D.D.T.-benzene-hexachloride mixture, dichlorodiphenyl dichloroethane, chlordane, and pyrethrins-piperonyl butoxide combinations. The insecticidal sprays were applied to the top and underlines at a pressure of approximately 150 pounds per square inch and at a rate of 1 to 2 pints per head.

In conformity with the recommendations of the Food and Drug Administration and the Bureau of Entomology and Plant Quarantine (1949), it was found that a safe and satisfactory insecticide for dairy herds would be a 1.0 per cent methoxychlor wettable powder. Proper concentrations of pyrethrins-piperonyl butoxide wettable powder sprays are also safe and effective, but they would have to be applied more



often. Satisfactory control of the flies on range herds may be obtained with 1.5 per cent D.D.T. wettable powder spray. Under Wyoming conditions it appears that a minimum of four or five treatments are required to provide adequate control, each treatment with D.D.T. or methoxychlor providing about 3 or 4 weeks protection.

LEGG, J. (1949.) A preliminary note on the use of two recently introduced insecticides, chlordane and toxaphene, in the control of the cattle tick (*Boophilus microplus*).—*Aust. vet. J.* 25. 65–66. 2304

Four cows heavily infested with *B. microplus* were sprayed with 0.25% emulsion of chlordane. This gave an excellent kill of young ticks, but adult females were little affected and laid viable eggs. Spraying at 28 day intervals kept the animals practically free from ticks. The chlordane emulsions as used by the authors were not suitable for dipping, under conditions where the fluid is required to remain homogeneous during a long period of time, as the active ingredient tends to separate out.

Preliminary tests with toxaphene (chlorinated camphene) at concentrations of 0.65 and 0.55% gave practically 100% kill. These concentrations were highly effective against engorged female ticks.—MARION T. SCOTT.

BRENNAN, J. M. (1949.) The use of N-butyl-acetanilide as a tick repellent.—*Rocky Mountain Lab. Circ.* No. 15. pp. 2. [Mimeographed.] [Author's summary copied *verbatim*.] 2305

Laboratory and field tests made by the Rocky Mountain Laboratory with various synthetic organic compounds showed N-Butyl-acetanilide to be an exceptionally promising repellent against the lone-star tick, *Amblyomma americanum*, and the Rocky Mountain wood tick, *Dermacentor andersoni*. It has not been tested against other species. The evidence

suggests that this compound is also a very effective chigger ("red bug") [*Trombicula* sp.] repellent and/or killing agent.

GOUCK, H. K. & FLUNO, J. A. (1950.) Field tests on control of American dog tick in Massachusetts.—*J. econ. Ent.* 43. 698–701. [Authors' summary amended.] 2306

Field tests were conducted to compare the effectiveness of D.D.T. and several other insecticides for the control of *Dermacentor variabilis*. Extensive observations were also made to determine the effectiveness against this tick of airplane applications of D.D.T. to large areas for the control of the gypsy moth, *Porthetria dispar* (L).

In comparative tests on small plots, D.D.T. and dieldrin [a chlorinated naphthalene derivative] were the most effective materials, 1 pound per acre of each yielding over 90% control of ticks for 5 to 6 weeks. D.D.T. at 2.5 pounds per acre gave effective control for at least 8 weeks. Toxaphene [a chlorinated camphene] and chlordane were slightly less effective than D.D.T. at both 1- and 2.5-pound dosages. Parathion [*o*-diethyl-*o*, *p*-nitrophenyl thiophosphate] at 0.5 pound per acre was relatively ineffective after the first week. Applications of 1 pound per acre of D.D.T., toxaphene, and chlordane in 1 gallon of oil (12% solutions) gave about as good control as the same dosage applied in 15 gallons of emulsion.

Observations in areas treated by airplane showed 85 to 91% control of ticks for 4 weeks, with a dosage of 1 pound of D.D.T. per acre. Applications of 0.25 to 0.5 pound per acre varied considerably in effectiveness but were generally much less effective than the 1-pound dosage. A 1-pound-per-acre application with a helicopter operating under optimum conditions gave about as good results as this dosage applied on small plots with ground equipment.

See also absts. 2241 (*Ornithodoros* as *Salmonella* carrier); 2276 (arthropod-borne Japanese B encephalitis in pigs); 2457 (report, East Africa); 2458 (report, Netherlands); 2459 (report, Denmark).

## PARASITES IN RELATION TO DISEASE [HELMINTHS]

WATTS, N. P. & MCCONNELL, K. P. (1951.) Effect of polonium<sup>210</sup> and selenium<sup>75</sup> in experimental *Schistosoma mansoni* infection in mice.—*Amer. J. Hyg.* 53. 11–16. [Authors' summary copied *verbatim*.] 2307

Neither alpha nor gamma radiation, as supplied by polonium and selenium in this experiment, have been observed to be damaging to the worm form of *Schistosoma mansoni* in the experimental infection in mice.

RAO, N. S. K. & CHOQUETTE, L. P. E. (1951.) On the finding of an intermediary host for

*Moniezia expansa* (Rud. 1810) in Eastern Quebec.—*Canad. J. Comp. Med.* 15. 12–14. [Authors' summary copied *verbatim*.] 2308

The authors report the finding of the oribatid mite *Scheloribates laevigatus* in eastern Quebec and its experimental infection with the larval stage of *M. expansa*. Completely developed larvae were first observed in the mite 75 days after its feeding. This mite has been reported as a vector of this sheep tapeworm in the United States and Russia. This is the second record of this mite as a vector of *M. expansa* in



North America and the first record of an intermediary host for anoplocephalid cestodes in Canada.

TODD, A. C., HANSEN, M. F., WYANT, Z. N., CROWDUS, D. H. & CAWEIN, M. J. (1950.) Continuous phenothiazine therapy for horses. III. The second year of treatment.—*Vet. Med.* 45. 429-434. [Abst. from Authors' summary.] 2309

Four groups of horses were fed 0.5, 1, 2, or 4 gm. of phenothiazine daily for two consecutive years. No harmful effects developed. Four examined P.M. at the end of the first year of treatment, and another four at the end of the second year were healthy.

There were pronounced effects on the internal parasites. Strongyle infections were reduced in proportion to amounts of phenothiazine fed, as shown by faecal egg counts and there was a continuing effect on the fertility of the strongyle eggs. Significant reductions occurred in the numbers of immature *S. vulgaris*, in the anterior mesenteric artery and its branches. No evidence was found to indicate that strains of this parasite resistant to the action of phenothiazine developed.

I & II. STEWART, D. F. (1950.) Studies on resistance of sheep to infestation with *Haemonchus contortus* and *Trichostrongylus* spp. and on the immunological reactions of sheep exposed to infestation. III. The antibody response to infestation with *Trichostrongylus* spp. IV. The antibody response to natural infestation in grazing sheep and the "self-cure" phenomenon.—*Aust. J. agric. Res.* 1. 413-426; & 427-439. [Author's summaries copied verbatim.] 2310

I. In infestation of sheep with *Trichostrongylus* spp. both the intake of larvae and infestation with adult worms stimulated the production of antibodies. The character of the antibody response in infestation with *Trichostrongylus* spp. thus differed from that caused by *Haemonchus contortus*. Sera of sheep dying from infestation with *Trichostrongylus* spp. were negative to the complement fixation test. It was found that older sheep responded serologically earlier and more vigorously to infestation with *Trichostrongylus* spp. than did young sheep. Subsequent doses of larvae of *Trichostrongylus* spp. elicited a more rapid and greater serological response, even in young sheep, than an initial dose of larvae. Previous infestation with *H. contortus* did not result in resistance to *Trichostrongylus* spp., whereas previous infestation with *Trichostrongylus* spp. heightened the resistance of sheep to subsequent infestation with the same

species. It is concluded that the relative resistance of older sheep to *Trichostrongylus* spp. is due, at least in part, to an earlier immunological response which is strengthened by subsequent doses of larvae. When infective larvae of *Trichostrongylus* spp. were superimposed upon an existing infestation of the same species, the egg count declined rapidly and the development of the superimposed larvae was resisted. Doses of infective larvae of *Trichostrongylus* spp. had no apparent effect on the egg counts of sheep infested with *H. contortus*.

II. Weekly tests, over a period of eighteen months, of the sera of a flock of grazing sheep showed a relationship between the serum titres and the faecal egg counts. This relationship was particularly obvious during the summer months. When egg counts fell, the titres rose, and as the titres dropped, the egg counts usually rose again. This relationship between egg counts and serum titres was more striking in individual sheep than in the whole flock because all the sheep did not behave similarly at the same time. The antibody levels rose in individual sheep irrespective of whether the sheep were heavily or lightly infested at the time. There was no evidence that a permanent resistance to *Haemonchus contortus* was acquired under field conditions.

Seven periods of "self-cure" occurred in the grazing flock during the period of observation. On each occasion the majority of sheep which showed a drop in egg count also showed a rise in serum titre. This behaviour was strikingly similar to the result when infective larvae of *H. contortus* were superimposed upon an existing infestation of *H. contortus* or *Trichostrongylus* spp. in penned sheep. "Self-cure" was produced in the field by giving naturally infested sheep large doses of infective larvae of *H. contortus* by mouth. A statistically significant fall in the faecal egg count of *H. contortus* and *Trichostrongylus* spp. but not of *Oesophagostomum columbianum* was produced by this means. The fact that "self-cure" takes place in naturally grazing flocks during the summer months after rain indicated that the intake of large doses of infective larvae of *H. contortus* was the exciting cause of the phenomenon.

STEWART, J. S. (1950.) Trichostrongylosis and haemonchosis in the camel: Their recognition and response to phenothiazine.—*Vet. Rec.* 62. 837-839. 2311

A dosage of 0.6 g. per kg. body weight of phenothiazine was required for treatment of trichostrongylosis in camels. *Haemonchus* infestation required a lower dosage.

—R. MARSHALL.



SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS and LEUCAEMIAS  
[INCLUDING FOWL PARALYSIS]

BLOOM, F., PAFF, G. H. &amp; NOBACK, C. R. (1951.)

The transmissible venereal tumor of the dog. Studies indicating that the tumor cells are mature end cells of reticulo-endothelial origin. —*Amer. J. Path.* 27. 119–139. [Authors' summary and conclusions slightly modified.] 2312

Previous attempts to classify the cell type of the transmissible venereal tumor of the dog have been based only on histologic examination. As a result the tumors have been designated by a variety of names with little unanimity of opinion. The authors' investigations, utilizing transmission, morphologic, cytologic, histochemical, and tissue culture studies, reveal that the tumor cell is a mature end cell of reticulo-endothelial origin. Instead of formulating a new name for the tumor, it is suggested that the designation "transmissible venereal tumor" be retained.

COPISAROW, M. (1948.) Cancer and the coordination of contact and inductive influences.

—*Edinb. med. J.* 55. 754–756. [Author's summary copied *verbatim*.] 2313

Recent work on chemiluminescence, ionizing radiations, photosensitizing substances and regional electron densities within the molecule reveals the existence of an inductive phase in all contact carcinogens and therefore provides a common basis for carcinogenic influences.

Carcinogens are characterized by their distorting effect upon the enzymic equilibrium of the organism. They suppress the enzymes which under normal conditions are responsible for inductive emissions over a wide spectrum range. Thus, carcinogenic action may be viewed as the penetration of the electric field surrounding the cell or as the suppression of metabolic inductive activity by pathogenic radiations.

It would, therefore, appear that anti-carcinogenic measures must be directed to the restoration of the normal enzymic equilibrium as already outlined in earlier papers.

RILEY, V. (1950.) Chromatographic studies on the separation of the virus from chicken tumor I. III. Titration curve of the agent.—*J. Nat. Cancer Inst.* 11. 229–235. [Author's summary copied *verbatim*.] 2314

The tumor-response curve resulting from the logarithmic titration of a chromatographed virus preparation in chickens is described. The implications of the curve in respect to an estimate of the number of virus particles in the fractions,

the minimum number required to induce a tumor, the number required at the 50-per cent-infectivity point, and other questions are discussed, based on the determined nitrogen of a single particle.

The data indicate that a relatively small number of virus particles of the order of 1 to 100, are capable of initiating a tumor in a susceptible chicken, and that the number required for the 50-per cent-infectivity point with the agent of chicken tumor I is considerably less than that required with another tumor-inducing agent, the virus of rabbit papilloma.

ESCHENBRENNER, A. B. &amp; MILLER, E. (1950.)

Effect of roentgen rays on the testis.—*Arch. Path.* 50. 736–749. [Abst. from authors' summary.] 2315

LAF<sub>1</sub> mice were exposed to 50 r, 100 r, 200 r, 300 r and 400 r of 186 kv. roentgen rays directed to the whole body at 3 months of age. The damage-recovery pattern was studied in terms of weight of fresh testes following a second 200 r roentgen irradiation of the whole body after the testes had recovered from an initial dose; and in terms of weights of fresh testes following exposure to a 10 mev source of roentgen rays for comparison with 186 kv. roentgen rays. The following tentative conclusions have been drawn: —The course of loss and recovery of weights of testes and the histological appearance during the damage and recovery period can be explained on the basis of a selective effect of radiation on a single stage of spermatogenesis, the spermatogonia. This effect of the doses used, on a single stage of spermatogenesis, is not one of cell death but is one of inhibition of division of spermatogonia to form daughter spermatogonia. Resting spermatogonia present at the time of irradiation appear to develop normally into spermatocytes, spermatids and spermatozoa. The process by which the spermatogonia divide into daughter spermatogonia and the secondary spermatocytes into spermatids is generally considered to be morphologically the same as somatic mitosis in general. The course of damage and recovery of the testis following exposure to a second dose of radiation is the same as that of damage and recovery following an initial exposure.

Because of its sensitivity and the reproducibility of results the testis is almost without parallel as a mammalian test organ for measuring the biologic effect of ionizing radiations.

BEARD, D., ECKERT, E. A., CZÁKY, T. Z., SHARP, D. G. & BEARD, J. W. (1950.) Particulate component of plasma from fowls with avian



**erythro-myeloblastic leucosis.**—*Proc. Soc. exp. Biol., N.Y.* 75. 533–536. [Author's summary copied *verbatim*.] 2316

A particulate material has been isolated by ultracentrifugal procedures from the filtered plasma of chickens diseased with avian erythro-myeloblastic leucosis. The particles were either spheroid in shape and of size varying from 60 to 100  $m\mu$  diameter or tailed structures with spheroidal heads and tails of 100 to 200  $m\mu$  lengths. Preliminary studies on small amounts of material yielded sedimentation diagrams showing definite, though diffuse, boundaries and an approximate sedimentation rate of 630 S. The ratio of nitrogen to desoxyribonucleic acid of the concentrates indicated a low content of the latter. Material of this sort was not found in the plasma of either normal chicks or chicks

See also *abst.* 2452 (induced testicular changes).

## NUTRITIONAL AND METABOLIC DISORDERS

SUBRAHMANYAN, V. & SUR, B. K. (1949.) **Supplementary value of lucerne to the poor South Indian rice diet.**—*Indian J. med. Res.* 37. 319–326. [Author's summary slightly modified.] 2318

Lucerne powder fed at 10% level makes an excellent supplement to the poor South Indian diet when fed to experimental animals. The extent of supplementation would nearly correspond to that obtained by providing a complement of yeast, casein, minerals, vitamins and milk. Animals fed the supplemented diet reproduce normally and rear about 40% of their young.

The beneficial effect is not exclusively due to the fats, fat-soluble vitamins, vitamins of the B group or other alcohol-soluble matter present in the lucerne.

The growth-promoting principles are equally distributed between the pressed juice from lucerne and the residue.

The heat coagulum of the juice does not effectively add to the value of the rice diet already supplemented with the residue obtained after pressing the juice.

In the usual stock diet as fed to rats, half the casein can be replaced by lucerne with equally good results.

NESHEIM, R. O. & JOHNSON, B. C. (1950.) **Response of pigs to streptomycin.**—*Proc. Soc. exp. Biol., N.Y.* 75. 709. [Author's summary copied *verbatim*.] 2319

The addition of 500 mg. per kg. dry matter of streptomycin to a nutritionally adequate "synthetic milk" containing 2 g. of sulfathali-

refractory to infection with the blood or plasma from birds with avian leucosis. The significance of the component in relation to the etiological agent of avian leucosis is discussed.

SKIPPER, H. E., CHAPMAN, J. B. & BELL, M. (1951.) **The anti-leukemic action of combinations of certain known anti-leukemic agents.**—*Cancer Res.* 11. 109–112. [Authors' summary copied *verbatim*.] 2317

A number of combinations of known anti-leukemic agents has been screened against mouse leukemia in search of synergistic activity. Only urethan plus nitrogen mustard exhibited evidence of synergistic activity, and this combination was less effective than aminopterin or A-methopterin for the rather acute Ak4 strain of leukemia used in these studies.

dine per liter produced a highly significant increase in the average daily gains and a highly significant reduction in the amount of dry matter required per kilogram body weight gain.

WAHLSTROM, R. C., TERRILL, S. W. & JOHNSON, B. C. (1950.) **Effect of antibacterial agents on growth of baby pigs fed a "synthetic" diet.**—*Proc. Soc. exp. Biol., N.Y.* 75. 710–711. [Authors' summary copied *verbatim*.] 2320

Aureomycin stimulated the growth of baby pigs on an alpha protein "synthetic milk" diet. It did not reduce the coliform, lactobacilli or yeast cells present in the feces. Sulfathalidine reduced the number of coliform bacteria present in the feces. There was no statistically significant beneficial growth-promoting effect from adding penicillin or sulfathalidine to the diet.

GORHAM, J. R., GRACIA, M. S. & BOE, N. (1951.) **Observations on the etiology of yellow fat disease in mink: preliminary report.**—*Vet. Med.* 46. 100–102. [Authors' summary copied *verbatim*.] 2321

Young mink placed on rations containing high percentages of fish scrap developed an acid-fast pigment in the adipose tissue. These changes did not occur when the diet was supplemented with an adequate level of vitamin E.

SILBERBERG, M. & SILBERBERG, R. (1950.) **Effects of a high fat diet on the joints of aging mice.**—*Arch. Path.* 50. 828–846. [Authors' summary copied *verbatim*.] 2322

In male mice of strain C57 black fed throughout life a diet containing 29 per cent



fat, articular aging was hastened as compared with that of controls fed a stock diet containing 5 per cent fat. Under the influence of the fat-enriched diet the incidence of osteoarthritis was increased two-fold and the onset of the disease significantly accelerated. As the incidence of osteoarthritis increased, that of simple age changes decreased. Articular age changes may, therefore, be considered as precursors of, and possibly pacemakers for, the severe lesions of degenerative joint disease. A number of animals remained free of articular changes even in old age and even if fed the fat-enriched diet. Under the conditions of the present experiment the overweight associated with the consumption of the high fat diet played only a minor role, if any, in the pathogenesis of degenerative joint disease.

EDWARDS, H. M., CUNHA, T. J., MEADOWS, G. B., SEWELL, R. F. & SHAWVER, C. B. (1950.) **Observations on aureomycin and APF for the pig.**—*Proc. Soc. exp. Biol., N.Y.* **75**, 445–446. [Authors' summary copied *verbatim*.] **2323**

Aureomycin supplementation produced considerable growth response with the pig when added to a diet containing vitamin B<sub>12</sub> and B<sub>12b</sub>. APF [a commercial aureomycin fermentation product]. Supplement 2 contains some factor(s) other than aureomycin and B<sub>12</sub> which accelerates growth in the young pig with the basal ration used. One per cent of APF Supplement 2 in the ration supplied enough aureomycin for the pig under the conditions of this experiment.

MOORE, T. (1949.) **The significance of protein in vitamin E deficiency.**—*Ann. N.Y. Acad. Sci.* **52**, 206–216. [Author's summary slightly amended.] **2324**

Evidence of the interrelation of vitamin E and casein in the nutrition of rats was obtained in experiments in which diets either adequate or inadequate in protein were given, in each case with or without supplements of tocopherol.

Protein had a predominating influence on the early stages of growth while vitamin E had a predominating influence on the maintenance of normal dental pigmentation. Vitamin E, however, improved early growth when the protein intake was moderately low. An adequate allowance of casein partially corrected dental depigmentation in the absence of vitamin E. When the allowance of protein was very low, rats not dosed with tocopherol declined continuously in weight, became anaemic, and eventually succumbed with necrotic liver lesions. The same initial rate of decline was shown by rats dosed with tocopherol, but, later, the fall in

weight was checked and, in most cases, there was some recovery towards the initial weight. Although the dosed animals remained in superficially good health, all were found to have severe fatty infiltration of the liver when killed at the end of the experiment. Brown fluorescent products, somewhat resembling the pigment found in the tissues of rats deficient in vitamin E, could be obtained from tryptophane,  $\beta$ -indolyl acetic acid, or skatole by chemical treatment. Deficient rats, however, showed no tendency to increased pigmentation when they were given large amounts of these substances.

CANNON, P. R., FRAZIER, L. E. & HUGHES, R. H. (1950.) **Studies in amino acid utilization. Tissue protein synthesis as influenced by the dietary intake of essential amino acids.**—*Arch. Path.* **50**, 709–720. [Abst. from authors' summary.] **2325**

A method has been described in which the repletion of protein-depleted adult male albino rats can be observed under conditions in which all dietary nitrogen is supplied as a solution of amino acids. By this method it has been possible to study the effects on tissue protein synthesis of an acute essential amino acid deficiency without any direct influence on acceptance of the basal ration through a possible modification of the latter's taste or odor. Nevertheless, if any one of nine indispensable amino acids was removed from the amino acid solution, its withdrawal was followed within twenty-four hours by a significant decline in consumption of the solution and a drop in weight. Food consumption fell off more gradually.

Refusal to drink an amino solution lacking a particular essential amino acid is apparently not due primarily to an alteration in taste or odor, in view of the delayed refusal. Neither can it be attributed to an immediate caloric deficiency. Evidently the rapidly functioning mechanisms of protein metabolism require the simultaneous availability of all the essential amino acids for effective tissue protein synthesis, and in the presence of an acute essential amino acid deficiency, catabolism quickly ensues.

SALMON, R. J. & MAY, C. D. (1950.) **Metabolism of tyrosine in experimental megaloblastic anemia and in scurvy in the monkey.**—*J. Lab. clin. Med.* **36**, 591–598. [Author's conclusions copied *verbatim*.] **2326**

Spontaneous excretion of *p*-hydroxyphenyl compounds and keto acids in scurvy and experimental megaloblastic anemia in the monkey does not differ significantly from the excretion of these compounds in the normal monkey. Increased



excretion of these compounds can be induced in the scorbutic monkey by administration of a testing load of *l*-tyrosine. The increased excretion of *p*-hydroxyphenyl compounds and keto acids caused by loading a scorbutic monkey with *l*-tyrosine can be reduced to the level of excretion by a normal monkey if ascorbic acid is administered simultaneously. PGA [pteroyl-glutamic acid] had no effect on the amount of *p*-hydroxyphenyl compounds and keto acids excreted by scorbutic monkeys in contrast to its reported effect in guinea pigs.

EVELETH, D. F. (1948.) **Cobalt in acetonemia, a case report.**—*Bull. N. Dak. agric. Exp. Sta.* 10. 158–159. 2327

A cow with acetonemia was given 1 g. cobalt chloride daily for three days and was cured within a week.—P. H. HERBERT.

KLOSTERMAN, E. W., DINUSSON, W. E., LASLEY, L. & BUCHANAN, M. L. (1950.) **Effect of trace minerals on growth and fattening of swine. [Cobalt.]**—*Science*. 112. 168–169. 2328

In pigs fed a basal diet plus iodized salt containing 0.026% cobalt as cobalt chloride there was an average daily gain of 1.34 lb. compared with 1.13 lb. for the control group, and 1.44 lb. for a group given salt containing trace elements copper, iron, manganese and cobalt.

Experiments are described to study relationship of cobalt to vitamin B<sub>12</sub> (animal protein factor APF) in effect on growth and fattening of pigs. Addition of cobalt stimulated weight gains more than addition of meat scraps to the basal diet, but less than the addition of APF supplement. All groups had weight increases above the control group significant at the 5% level. The action of cobalt is discussed.

—G. LEWIS.

TEAGUE, H. S. & CARPENTER, L. E. (1951.) **The demonstration of a copper deficiency in young growing pigs.**—*J. Nutrit.* 43. 389–399. [Authors' summary copied *verbatim*.] 2329

A copper deficiency produced in young growing pigs has been described. In addition to a dietary anemia, an unusual leg condition was encountered. There was lack of rigidity in the leg joints. The hocks became excessively flexed and forced the animal to assume a sitting position: The forelegs showed various types and degrees of crookedness. In the extreme state the use of the forelegs was also lost and the animal, although not paralyzed, remained in a prone position. Copper was shown to be therapeutic and in some cases brought about a complete reversal of symptoms.

SMITH, S. G. & LASATER, T. E. (1950.) **A diabetes insipidus-like condition produced in dogs by a potassium deficient diet.**—*Proc. Soc. exp. Biol., N.Y.* 74. 427–431. [Authors' conclusions slightly modified.] 2330

Dogs depleted of potassium show a marked increase in fluid exchange. The increase begins usually within 24 hours after being placed on the potassium deficient diet provided the dog is healthy at the start of the experiment. A peak in the curve is reached after 3–7 weeks and then there is a gradual decline back to nearly normal values. Factors responsible for this phenomenon are still undetermined.

VAN DER KAAJ, F. C., TEUNISSEN, G. H. B., EMMERIE, A. & VAN EEKELLEN, M. (1949.) **The tocopherol serum level of cows and horses in relation to reproduction.**—*Ann. N. Y. Acad. Sci.* 52. 276–283. [Authors' summary and conclusions slightly modified.] 2331

The tocopherol level in normal cows was not constant. It depends greatly on nutrition. In grass feeding (summer), the level is about 800 µg./100 ml. of serum. In winter, 100–200 µg./100 ml. is found. This level is independent of pregnancy, parturition, and lactation. There is a slight influence of the age of the animals (probably of nutritional origin).

Cows aborting from *Brucella* infections showed no particularly low tocopherol level. There is no reason to assume a vitamin E deficiency in these cases. Cows with *Brucella* infection but not aborting had a normal level.

In sterile, nymphomaniac, and anaphroditic cows the tocopherol content was normal.

The administration of tocopherol, *per os*, intramuscularly, or intratracheally, usually given in veterinary practice, did not cause a rise of the tocopherol value of blood serum.

In pregnant and non-pregnant mares, the tocopherol content of the blood serum was much more constant and independent of summer and winter feeding. In sterile horses the value was the same.

Although this investigation has given a clear picture of the tocopherol level in blood under various conditions, no relation between this level and sterility, occurring in farm animals, was observed.

ADAMSTONE, F. B., KRIDER, J. L. & JAMES, M. F. (1949.) **Response of swine to vitamin E-deficient rations.**—*Ann. N.Y. Acad. Sci.* 52. 260–268. [Author's summary and conclusions copied *verbatim*.] 2332

The experiment reported in this article shows that, as a result of feeding swine on a



vitamin E-deficient diet, the following effects are produced: (1) The reproductive performance of sows is greatly lowered, apparently as a result of death of embryos rather than through any interference with ovulation and implantation, just as has been found in the E-deficient rat. No evidence was obtained as to the relation of hemorrhage to death in E-deficient embryos. (2) Pigs from sows which were reared on the deficient diet exhibit muscular incoordination caused by disintegration and necrosis of the muscle fibres. (3) Abnormalities observed in the liver are not regarded as of diagnostic significance; and the effects on the testis were not extensive, because of the immaturity of the animals. (4) Vitamin E appears to be necessary to maintain normal health and growth in the young pig, although the results of the present experiments are not regarded as absolutely conclusive.

CARPENTER, L. E. & LUNDBERG, W. O. (1949.) **Effect of tocopherols on vitality of pigs in relation to "baby pig disease".**—*Ann. N.Y. Acad. Sci.* 52. 269–275. [Authors' summary slightly modified.] 2333

It appears that supplementation of the diet of the dams with tocopherols during the gestation period did not affect the size or apparent health of the pigs at birth but did favourably affect the viability and the growth of the unweaned piglets under environmental conditions in which so-called "baby pig disease" is enzootic.

Supplementation of the pig diets with tocopherols during the post-weaning period did not affect the growth of the pigs, regardless of whether the pigs had been farrowed by dams that had received tocopherol supplements.

The store of tocopherols in the body fat of the pigs that received no supplement of tocopherols during the post-weaning period was at about the same level, regardless of the dietary regime of their dams. However, supplementation during the post-weaning period did increase the store of tocopherols in the body fat.

ATKINSON, W. B., KAUNITZ, H. & SLANETZ, C. A. (1949.) **Effects of ovarian hormones upon uterine pigmentation in vitamin E-deficient rats.**—*Ann. N.Y. Acad. Sci.* 52. 68–71. [Authors' summary copied *verbatim*.] 2334

Rats ovariectomized at weaning and maintained 5 to 10 months on a vitamin E deficient diet, relatively low in unsaturated fat, did not develop the acid-fast pigmentation on the uterine muscle characteristic of the intact E-deficient controls. Ovariectomized rats treated with

estrogen during the course of the avitaminosis developed uterine pigmentation similar to that seen in intact E-deficient animals. Treatment of ovariectomized E-deficient rats with progesterone did not promote pigment deposition. Progesterone given to E-deficient ovariectomized rats concurrently with estrogen may partially neutralize the pigmentation-promoting effect of the latter hormone.

ELFTMAN, H., KAUNITZ, H. & SLANETZ, C. A. (1949.) **Histochemistry of uterine pigment in vitamin E-deficient rats.**—*Ann. N.Y. Acad. Sci.* 52. 72–79. [Authors' summary copied *verbatim*.] 2335

The pigment of vitamin E-deficient rats, as studied in the uterus, gives the following characteristic reactions: Strong affinity for Sudan black B. Combination with basic dyes at pH4 and above. Reduction of silver diammine and ferric chloride-ferricyanide. Oxidation by periodic acid. Insolubility in ordinary fat solvents. Absence of demonstrable iron.

All of the characteristic reactions of the pigment are also given by oxidized cod-liver oil. Since histochemical tests for protein were uniformly negative, the present investigation adds evidence in favour of the origin of the pigment of vitamin E deficiency by the peroxidation and polymerization of unsaturated fat. On the basis of these reactions the pigment may be classified as a lipofuscin. Although it differs from the published descriptions of ceroid in its oxidation potential, further study of ceroid may establish a fundamental similarity.

LOPES DE FARIA, J. (1949.) **Uterine and vaginal changes in rats with avitaminosis E. II. Collagenous fibers content of the endometrium of normal rats at different ages.**—*Ann. N.Y. Acad. Sci.* 52. 121–124. [Author's summary and conclusion copied *verbatim*.] 2336

The author, in order to elucidate whether the endometrial fibrosis observed in rats with avitaminosis E is due to the vitamin deficiency or to the advanced age of the animals, studied the endometrium of rats from 9 to 690 days old. He noted, confirming the reports of other authors, that there is a progressive increase of the endometrial collagen with advancing age in the animals. On the basis of comparisons made between the uteri of vitamin E-deficient rats, previously described, and those of normal rats of comparable ages included in the present study, it was concluded that this fibrosis of the deficient animals was related to the advanced age of the animals and not due to the vitamin E deficiency.



HOVE, E. L. (1949.) **Comparison of a fatal tocopherol deficiency disease in rats with the syndrome caused by  $\text{CCl}_4$** —*Ann. N.Y. Acad. Sci.* 52. 217-224. [Author's summary copied *verbatim*.] 2337

An attempt has been made to establish whether a  $\text{CCl}_4$  [Carbon tetrachloride] toxicity induces a true vitamin E deficiency in rats fed a 10 per cent casein diet.

It was found that young rats given 0.05 cc. of  $\text{CCl}_4$  per week died after an average of 31 days on experiment. Similar rats on the same diet, but not receiving  $\text{CCl}_4$  died suddenly at an average time of 71 days on diet. In both cases, death was preventable by supplements of alpha-tocopherol, and the lesions seen at necropsy were identical grossly and histologically. Massive lung hemorrhage, liver necrosis, blanching of the incisors, and lower growth rate were noted.

In a second set of experiments, it was found that single sublethal injections of  $\text{CCl}_4$  into rats produced a creatinuria and a hypo-creatininuria. Chronic vitamin E deficiency produced a similar, but less marked, excretion pattern. In both cases, supplements of alpha-tocopherol substantially corrected this abnormal excretion.

RODERUCK, C. E., BASINSKI, D. H. & BARBER, M. A. (1949.) **Some chemical and enzymic alterations in muscles in experimental dystrophy**.—*Ann. N.Y. Acad. Sci.* 52. 156-160. Discussion 160-162. [Authors' summary copied *verbatim*.] 2338

The increased  $\text{QO}_2$  of dystrophic muscle strips from animals deficient in vitamin E is not influenced by the addition of certain substrates or of diphosphopyridine nucleotide to the nutrient medium in which the strips are respiring. The biotin content of muscle tissue from dystrophic animals does not differ from that of the muscles of control animals. The glutamine level of muscle from vitamin E-deficient guinea pigs and rabbits is decreased from that of normal animals. The transaminase activity of skeletal muscle homogenates from dystrophic guinea pigs and rabbits is lower than that of muscles from control animals.

MERRITT, P. (1950.) **The effect of a deficiency of the B vitamin complex (except thiamine) on the blood pressure of the rat**.—*J. exp. Med.* 92. 333-336. [Author's summary slightly modified.] 2339

Certain diets essentially identical with those previously reported as causing an elevation of the blood pressure of rats have failed to produce any elevation.

Examination of micro sections from the kidneys of these rats, with the aid of special

stains, has failed to demonstrate any vascular lesions similar to those previously described by Calder.

Evidence of tubular atrophy was present to a minor degree in sections of the kidneys of rats fed diets deficient in the B vitamins (except thiamine) and in those fed diets low in choline. This finding has been noted previously by others, but examples of this type of lesion were found as well in animals fed the control diets of these experiments. It should be emphasized that these control diets were nutritionally inadequate.

Deposits of intracellular granules of hemosiderin were prominent in the convoluted tubules of the kidneys in rats fed the diets deficient in the B vitamin complex.

DRAPER, H. H. & JOHNSON, B. C. (1951.) **Thiamine deficiency in the lamb**.—*J. Nutrit.* 43. 413-422. [Authors' summary and conclusions copied *verbatim*.] 2340

The performance of a group of 4 lambs, one to three days old, fed a "synthetic" milk diet deficient in thiamine, was compared to that of two positive controls. Those receiving the deficient diet developed anorexia, emaciation and somnolence after about three weeks, followed by tetanic convulsions. These symptoms were rapidly abolished by the administration of thiamine. Transitory convulsive spasms were also obtained by injecting sodium pyruvate. The lambs receiving the same diet with thiamine added grew satisfactorily and appeared normal.

The results obtained in this experiment support the conclusion that thiamine is an essential nutrient for the lamb.

RINEHART, J. F. & GREENBERG, L. D. (1951.) **Pathogenesis of experimental arteriosclerosis in pyridoxine deficiency**.—*Arch. Path.* 51. 12-18. [Authors' summary and conclusions copied *verbatim*.] 2341

Arteriosclerotic lesions develop regularly in the rhesus monkey subjected to prolonged pyridoxine deficiency. The initial lesion is characterized by the accumulation of a mucinous substance in the intima and, to a less extent, in the media of the arteries involved. This material exhibits the metachromatic staining property characteristic of mucopolysaccharides. Associated with the accumulation of this substance, cellular proliferation occurs and collagenous and elastic tissue fibres are formed. Studies of human arteriosclerosis indicate that basically similar sequences are seen in the evolution of the human disease. The role of lipids in the experimental and the human disease is briefly discussed. The morphologic features of the experimental vascular lesions and those occurring in man are



similar. The possible role of pyridoxine deficiency in the etiology of human arteriosclerosis remains to be determined.

MINNICH, V., MOORE, C. V., SMITH, D. E. & ELLIOTT, G. V. (1950.) Studies on the acute toxic effects of 4-amino-pteroylglutamic acid in dogs, guinea pigs and rabbits.—*Arch. Path.* 50. 787–799. [Part of authors' summary and conclusions copied *verbatim*.] 2342

A distinct difference in the susceptibility of dogs, guinea pigs and rabbits to the toxic effects of 4-aminopteroylglutamic acid was demonstrated. Dogs were the most sensitive of the three species of animals. With large amounts, hypoplasia of the marrow was an invariable result. The reasons for regarding the manifestations of 4-aminopteroylglutamic acid toxicity as evidences of an acute folic acid deficiency are discussed, and a possible mechanism of action of 4-aminopteroylglutamic acid is reviewed. Large amounts of folic acid were able to provide a high degree of protection in dogs against doses of the antagonist which otherwise were lethal. The protection achieved in guinea pigs was less complete.

WOOLLEY, D. W. (1951.) Selective toxicity of 1, 2-dichloro-4, 5-diaminobenzene: its relation to requirements for riboflavin and vitamin B<sub>12</sub>.—*J. exp. Med.* 93. 13–24. [Author's summary copied *verbatim*.] 2343

In a series of 26 species selected from widely differing classes, 1, 2-dichloro-4, 5-diaminobenzene was toxic to those which did not exhibit a nutritional need for riboflavin plus vitamin B<sub>12</sub>. It failed to retard the growth of those which needed both of these vitamins. The compound was conceived as an antimetabolite of 1, 2-dimethyl-4, 5-diaminobenzene. This latter, which is contained within the structures of the two vitamins, was pictured as a metabolic precursor of them. It was found to have very slight activity as either riboflavin or as vitamin B<sub>12</sub> for lactic acid bacteria and algae. The growth-inhibiting action of the dichlorodiaminobenzene was overcome competitively by the dimethyl-diaminobenzene, and also, to a lesser extent, by *o*-phenylenediamine. The toxicity was not influenced by additions of riboflavin plus vitamin B<sub>12</sub>, except in the cases of two species, where the influence was slight. These facts were considered to support the idea that properly constructed analogs of a precursor of two or more essential participants in cell division may be able to circumvent the counteraction which the vitamin has been found to exert on an antimetabolite of its precursor. Alternate explana-

tions of the observed data were likewise considered.

STOKSTAD, E. L. R. & JUKES, T. H. (1951.) Effect of various levels of vitamin B<sub>12</sub> upon growth response produced by aureomycin in chicks.—*Proc. Soc. exp. Biol., N. Y.* 76. 73–76. [Authors' summary slightly modified.] 2344

The vitamin B<sub>12</sub> requirement for growth of chicks was studied on a deficient diet with and without the addition of aureomycin. In some experiments, a "sparing effect" of aureomycin upon vitamin B<sub>12</sub> requirement was noted but in others no effect was observed. A growth-promoting effect for aureomycin was noted both in the presence and absence of added vitamin B<sub>12</sub>. The mortality of deficient chicks on the diet containing no added vitamin B<sub>12</sub> was markedly reduced by aureomycin. The addition of sulfamethazine to the diet did not appear to affect the quantitative requirement of chicks for vitamin B<sub>12</sub>.

WATTS, P. S. (1950.) Studies on vitamins A and C in bovines. Vitamin C in the liver, kidney and plasma of cows, calves and foetuses.—*J. comp. Path.* 60. 283–293. [Author's summary copied *verbatim*.] 2345

The mean values of vitamin C in the livers were as follows:  $23.2 \pm 0.23$  mg./100 g. for 370 cows,  $29.3 \pm 0.50$  mg./100 g. for 144 calves up to 7 days old and  $17.4 \pm 0.92$  mg./100 g. for 62 foetuses. The mean value in the kidney in 367 cows was  $8.5 \pm 0.61$  mg./100 g. and in the plasma of 197 cows it was  $0.26 \pm 0.0075$  mg./100 ml. The liver values were significantly less during May and June and the kidney and plasma levels significantly higher during the period of turnip feeding, i.e., during the colder months of December, January, February and March. The concentration in the livers of foetuses was significantly lower and in calves significantly higher than in cows. There was an abrupt increase in the concentration of vitamin C in the liver at the time of birth.

JOHNSON, B. C., MITCHELL, H. H., PINKOS, J. A. & MORRILL, C. C. (1951.) Choline deficiency in the calf.—*J. Nutrit.* 43. 37–48. [Authors' summary copied *verbatim*.] 2346

On a "synthetic milk" diet containing 15% casein or 15% casein plus 0.3% cystine as the nitrogen source, two-day-old dairy calves were found to require a supplementary source of choline. When choline was omitted from the diet, an acute deficiency syndrome developed in about 7 days. The symptoms included marked weakness and inability to get up, labored or



rapid breathing and anorexia. Unless the deficiency had progressed too far, the calves responded to choline therapy. Later removal of choline from the diet did not appear to have any harmful effects.

HIBBS, J. W. (1950.) Milk fever (parturient paresis) in dairy cows—a review.—*J. Dairy Sci.* 33. 758–789. 2347

This is a detailed review, with 278 references, of work on the nature and cause of milk fever. H. concluded that further elucidation may depend on studies on the physiology of the parathyroids at parturition.—A. T. COWIE.

SELLERS, K. C. & PUGH, P. D. S. (1951.) The occurrence of ketosis in pregnant ewes, associated with parasitism.—*Vet. Rec.* 63. 40–41. [Authors' summary copied *verbatim*.] 2348

Deaths in a flock of ewes at lambing time associated with a heavy parasitic infestation were investigated. Analysis of blood samples for ketone bodies (expressed as mg. of acetone per cent.) showed a mean value of 1.8 mg. per cent. (1.5 to 2.2 mg. per cent.) for pregnant ewes in good condition, 14.3 mg. per cent. (11.6 to 18 mg. per cent.) for pregnant ewes in poor condition and 1.7 mg. per cent. (1.1 to 2.3 per cent.) for ewes in poor condition after lambing.

The possible relationship between parasitism and ketonaemia is discussed briefly.

JUNGHER, E. L. (1949.) Ten-year incidence of field encephalomalacia in chicks and observations on its pathology.—*Ann. N.Y. Acad. Sci.* 52. 104–112. [Author's summary slightly modified.] 2349

On the basis of the available laboratory diagnostic data, the incidence of acute field encephalomalacia from 1946 to 1947 ranged from 3 to 32 case lots, with an average of 18, per year. There were peaks in 1936 and in 1940 and the incidence was low in 1945. In 1948, there were 62 known cases. The reasons for the yearly fluctuations were unknown. Feeding of a high

energy-low fiber ration was not accompanied by an undue increase in 1947, but was in 1948. In the latter year, reduction of high fat-containing animal protein supplements in the diet seemed to bring about a decrease of the incidence.

Histopathologic observations on field specimens brought out: (a) that encephalomalacic foci in the brain may often be located outside the cerebellum and thus escape gross detection; (b) that extensive cerebellar fibrosis may occur with or without associated ischemic necrosis, the latter pathognomonic for the acute disease in chicks; (c) that the extracerebellar portions of the brain frequently show large areas of increased vascularity accompanied by varying degrees of adventitial cell proliferation; (d) that necrotic and reparative lesions are seen occasionally at one week of age and thus suggest parentally transmitted deficiency; and (e) that reparative lesions may occur up to 32 weeks of age, alone or in association with other neuropathologic entities. Apparently recovered cases of field encephalomalacia may either escape detection or be diagnostically misleading.

Proved cases of field encephalomalacia have failed to exhibit evidence of vitamin A-hypovitaminosis by the method of nasal histopathology. Both spontaneous cases of field encephalomalacia and experimental cases of A-hypo- and hypervitaminosis showed achromatic pinpoint areas in the brain, which, therefore, were considered nonspecific for vitamin A deficiency.

Attention is called to the occurrence of clinically inapparent conditions resembling experimental E-avitaminoses in birds, namely: dystrophy of the voluntary muscle in pheasants, similar to that in ducklings, and dystrophy of the involuntary ventricular muscle in chickens, similar to that in poults.

The report brings out the relatively frequent occurrence in birds fed untreated natural feed stuffs of pathologic conditions reproducible by vitamin E-deficient diets. The occurrence of chronic lesions enhances the pathologic spectrum of field encephalomalacia.

## DISEASES, GENERAL

MACDONALD, G. (1950.) The analysis of infection rates in diseases in which superinfection occurs.—*Trop. Dis. Bull.* 47. 907–915. [Author's summary copied *verbatim*.] 2350

The relationship between the amount of infective material to which a population is exposed and the resulting infection rates is considered. It is pointed out that the relationship when superinfection occurs may be different

from the relationship when the possibility of superinfection is excluded.

Most previous workers have excluded the possibility of superinfection. The case when it is allowed is studied mathematically. The relationship found is quite different in principle, as well as in degree, from that when superinfection does not occur.

The probability of an infected person re-



maining infected at a subsequent examination is studied, and a general formula is deduced. In some cases this represents an actual recovery rate, though less than the standard recovery rate from a single infection. Where the inoculation rate is high the recovery rate sinks to zero.

In some cases the probability of being found positive at subsequent examination is shown to increase. This is considered to represent a progressive multiplication in the load of infection which must result in supersaturation. It is thought that this represents mathematically the condition described as hyperendemicity in malaria.

The limit or ultimate level of infection rates is considered, and general formulae showing their relation to inoculation rates, recovery rates, and fatality are deduced. These differ radically from similar findings when superinfection is excluded, and particularly in that the value of the limit has an almost linear relation to the inoculation rate.

The proportion affected at varying ages is studied and general formulae are deduced. The nature of the curve is discussed.

It is suggested that study of infection rates in infants, on the lines developed, may have important practical implications in malaria. It is also pointed out that the case is a general one, referring to all diseases in which superinfection occurs, and that it might have a bearing on the epidemiology of tuberculosis.

BRONS, A. W. (1948.) *Bijdrage tot de kennis van de bouw van de funiculus umbilicalis van het veulen in het bijzonder met betrekking tot de genese en de prophylaxis der omphalogene infectie. [The structure of the umbilical cord of the foal.] Thesis Utrecht.*—pp. 96. [Abst. from English summary.] 2351

B. presents a critical and detailed review of the anatomy of the umbilical cord of the foal. Among the points raised is the suggested absence of Wharton's-jelly in the embryonic connective tissue of this species.

The relationship and histology of the component parts are discussed from the point of view both of the method of closure and predisposition to umbilical infection. In B.'s opinion closure is effected by the formation of blood clots within the lumen and beneath the adventitial coats of the vessels in the intermediate part of the cord, *i.e.*, that portion associated with the sheath of the rectus abdominis muscle at the site of the umbilical ring; the whole accompanied by contraction of the walls. The various routes of infection are outlined, and

the merits of hygienic and immediate post-natal care reviewed.—C. W. OTTAWAY.

UDALL, D. H. (1950.) "*Sulfathalidine*" *phthalylsulfathiazole in the prevention and treatment of diarrhea in calves.*—*Rep. N.Y. State vet. Coll.* 1948–1949, pp. 132–138. [Author's summary and conclusions copied *verbatim*.] 2352

These observations show that with the use of an open-pen system of raising calves, pneumonia ceased to exist. After the adoption of multiple housing for calf and maternity units, the use of nurse cows for raising calves, and of sulfathalidine in the prevention and treatment of diarrhea, there has been a marked and progressive decrease in calf septicemia and scours.

LUKE, D. & GORDON, W. A. M. (1950.) *Observations on some pig diseases.*—*Vet. Rec.* 62. 179–185. Discussion p. 185. 2353

*Oedema disease of pigs.*

A general account is given of the so-called "gut oedema" of pigs.

Penicillin, the sulphonamides, hyperimmune *Cl. welchii* sera, adrenalin in repeated doses, an antihistamine drug, and magnesium sulphate, in conjunction with a reduced and fluid dietary have all been tried therapeutically but none was effective.

Unsuccessful attempts to reproduce the disease in pigs were made by:— (a) feeding, and subcutaneous inoculation of oedematous organs;

(b) intracranial, epidural, intra-ocular, intranasal and subcutaneous inoculation of brain and spinal cord from affected animals; (c) field contact; (d) suddenly improving the plane of nutrition; (e) feeding a diet containing activated cyanogenetic glucoside; (f) feeding the same diet as that fed to pigs which had died of the disease; (g) attempting to produce alimentary anaphylaxis using extracts.

Bacteriological examinations have been unproductive, and it has been impossible to demonstrate the formation of toxin in the bowel by animal inoculation or anaerobic culture.

The possibility of the disease being caused by a virus is discussed and it is compared with Teschen Disease.

*An eczematous condition of unweaned piglets.*

A moist eczema affecting unweaned pigs usually in the first three weeks of life can be controlled by painting the sow's udder with a mixture of ferrous sulphate, copper sulphate, treacle and "marmite" (a vitamin B supplement).



*Ascarid infestation in pigs.*

Commercial sodium fluoride (73% purity) is an efficient and safe ascaricide when given either as 1% of feed calculated as dry meal, or at the rate of 0.1–0.15 gramme per lb. body weight to swill fed pigs but to obtain maximum efficiency and safety the drug must be administered with care.

*Piglet anaemia.*

The aetiology and treatment are summarized. It is emphasized that the administration of 0.5 g. of reduced iron on the seventh day after birth provides adequate control.

*Trembling in young pigs.*

In three litters by one boar, but out of different sows "trembling" ("myoclonia congenita" of other authors) was observed at birth. The condition does not appear to be contagious or of genetic origin.

Previous reports of its occurrence in other countries are summarized. This is the first report of its occurrence in Britain.—J. T. DONE.

BELLET, S., GAZES, P. C. & STEIGER, W. A. (1950.) **The effect of potassium on the electrocardiogram in the normal dog and in dogs with myocardial infarction.**—*Amer. J. med. Sci.* 220. 237–246. [Authors' summary copied verbatim.] 2354

The effects of potassium administration on the electrocardiogram in 31 dogs are reported. Of this group there were 9 normal dogs, 12 with acute infarcts, 6 with healed infarcts, and the endocardial potentials of the left ventricle were determined in one normal animal and in one with an acute infarction; the determination of the reversibility of electrocardiographic effects after toxic doses was determined in 2 dogs.

Three patterns of T and ST changes were observed: *a*, normal, consisting of increase in amplitude of T wave with narrowing of the base and depression of the ST segment; *b*, intermediate type, observed in hearts with small infarcts which involved chiefly the endocardial portion of the left ventricle, consisting of diminution in amplitude of the T wave and inversion of the T wave. The amplitude of the T wave remained small; *c*, acute infarction pattern, observed in transmural infarcts and characterized by an increase in amplitude of the inverted T wave, its configuration practically an inverted image of that observed in the normal. Subsequent toxic effects which consisted of bundle branch block, ventricular tachycardia, and bradycardia were observed in both normal and infarcted dogs.

The terminal cardiac mechanism in normal dogs was cardiac arrest. In those with myo-

cardial infarcts, death in most instances was due to ventricular fibrillation.

There was no evidence of cumulation of potassium effects. Maximum electrocardiographic changes were observed at the time of its administration. Even at the stage of marked QRS widening and ventricular tachycardia, the electrocardiograph effects were reversible upon cessation of potassium administration.

The relationships of the experimental data to the clinical problem of hyperpotassemia in normal and infarcted hearts—similarly of initial and toxic effects, and of reversibility, complications and so on—are discussed.

BELLET, S., STEIGER, W. A. & GAZES, P. C. (1950.)

**The effect of different grades of myocardial infarction upon the tolerance to potassium: an experimental study in dogs.**—*Amer. J. med. Sci.* 220. 247–256. [Authors' summary copied verbatim.] 2355

Myocardial infarction does not gravely affect tolerance to the intravenous administration of potassium chloride.

Isotonic potassium chloride (1.14%) was administered intravenously at a rate of 10 cc. per minute to normal dogs with acute and chronic myocardial infarctions. Almost continuous ECG's and continuous blood pressure records were taken. Blood samples for electrolyte determination were collected immediately upon the development of significant ECG alterations.

Normal dogs died at serum concentrations of 13.9 to 18 mEq. per liter of potassium. Dogs with minor degrees of myocardial damage showed a lethal serum concentration similar to the normal. Dogs with moderate to severe grades of infarction, both acute and chronic, showed a significant decrease in the lethal serum concentration of potassium at death.

The development of intraventricular block, which is taken to be definite evidence of potassium toxicity, developed at a significantly lower level in all types of acutely infarcted dogs (Grade 1 to 4) as compared to the normal.

In 6 dogs with healed myocardial infarction there was no significant change from normal in the serum concentration at which intraventricular block occurred, but death occurred at a slightly lower concentration as compared to the normal control.

No correlation was evident between the quantity of potassium chloride administered per kg. of body weight and the serum level of potassium at death.

Following the administration of potassium to normal dogs the potassium effect was reversible



up to the stage of a marked degree of bundle branch block and ventricular tachycardia.

With the method of potassium chloride administration used in these experiments, the rise in serum potassium concentration did not appear to be a linear function of time. The following sequence was usually seen: an initial rapid rise, then a tendency to plateau, followed by a terminal increase in slope.

The significance of these findings—tolerance to potassium with a normal cardio-renal system, evidence of toxicity at lower levels of serum potassium in the presence of acute infarction, and so on—relative to the clinical problem is discussed.

SILVER, M. L. (1949.) **Canine epilepsy caused by flour bleached with nitrogen trichloride. IV. Histopathology.**—*J. Neuropath. exp. Neurol.* 8. 441-445. 2356

S. described histopathological changes found in dogs, which after being fed a nutritionally adequate diet containing 50-75% of flour bleached with nitrogen trichloride [see also Silver *et al.* *V.B.* 19. 620; & 20. 383], later developed convulsions and a terminal loss of ability of the kidney to concentrate urine.

The studies revealed degeneration of the cerebellum as evidenced by chromatolysis and loss of neurones in the Purkinje layer, the dentate nucleus and some of the brain-stem motor nuclei. Increased fatty degeneration of the kidney tubules was also observed.—E. M. J.

WILD, J. J. & NEAL, D. (1951.) **Use of high-frequency ultrasonic waves for detecting changes of texture in living tissues.**—*Lancet.* 260. 655-657. [Authors' summary copied *verbatim.*] 2357

The principle of the ultrasonograph is explained. Tissues of different texture give different ultrasonograms. Tissues of abnormal texture can be detected by ultrasonography. No harmful effects were found in tissues subjected to ultrasonic waves of the energy used in ultrasonography.

KORSON, R. (1951.) **A microspectrophotometric study of red cell nuclei during pyknosis.**—*J. exp. Med.* 93. 121-128. [Author's summary copied *verbatim.*] 2358

A microspectrophotometric apparatus was used to measure nuclear absorption in fixed and stained human bone marrow smears. The validity of the measurements was established. The total and polymerized desoxyribose nucleic acid (DNA) of erythroblast nuclei were measured in relative units, and a gradual loss of DNA

from the red cell nucleus during maturation was noted. The loss in DNA is comparable quantitatively to that occurring during pathological pyknosis in sarcoma cells. The continual loss of nuclear material during erythropoiesis supports the conception that the nucleus disappears by intracellular dissolution, not by extrusion in the intact form.

TSUBOI, K. K., STOWELL, R. E. & LEE, C. S. (1951.) **Chemical alterations induced in mouse liver following a single feeding of carbon tetrachloride.**—*Cancer Res.* 11. 87-93. [Authors' summary slightly modified.] 2359

A general chemical characterization of the processes of liver degeneration and regeneration in mice following a single feeding of carbon tetrachloride has been presented. An increase in water and corresponding decreases in the level of liver neutral fat were found to accompany these processes. Considerable overlapping between the initial necrosis and subsequent regenerative process was evident. This resulted in a net increase in tissue bulk, due, presumably, to a restoration of tissue at a rate in excess of the removal of necrotic cells.

Studies on the distribution of nitrogen and phosphorus following carbon tetrachloride administration were presented and discussed in relation to the degenerative and regenerative processes.

Nucleic acid analyses indicated that loss of both pentose and desoxypentose types was associated with liver necrosis, and considerable increases in both were related to the restoration process. A comparison of the quantitative relationships between pentosenucleic acid, desoxypentosenucleic acid, and protein nitrogen levels at various intervals throughout the active phase of liver regeneration was presented and discussed.

WILLIAMS, W. L. (1950.) **Vital staining of damaged liver cells. III. Reactions of normal and injured hepatic parenchyma of mice to rose bengal.**—*Yale J. Biol. Med.* 23. 177-183. [Author's summary copied *verbatim.*] 2360

In mice, carbon tetrachloride produced hepatic parenchymal damage in which the excretion of rose bengal was significantly retarded. This delay in clearance consisted of retention of dye within the cytoplasm of centrilobular cells and of staining of cytoplasmic constituents by it. Following treatment with the same amount (0.04 cc.) of carbon tetrachloride, the period of dye retention and cytoplasmic staining was longer at 48 hours subsequent to injection of the hydrocarbon than at 24 hours. Evidence of cytoplasmic injury was greater after the longer



interval. At 24 hours subsequent to injection of carbon tetrachloride the extracentral zones showed a slightly prolonged interval of dye retention which was not observed at 48 hours. Obvious necrosis and lysis of damaged parenchymal cells did not occur until 72 hours after treatment with carbon tetrachloride. The inhibition in clearance of rose bengal was characteristic of the pre-necrotic or precytolytic phase of injury and the eventual excretion of dye by damaged cells indicated the presence of a residual, but defective excretory mechanism.

A delay in clearance of rose bengal occurred in livers of mice that had received a smaller (0.01 cc.) dose of carbon tetrachloride 8 days prior to the dye. At this time livers exhibited no clear histological evidence of residual injury other than a slight decrease in cytoplasmic granulation and basophilia of some of the centrilobular cells.

HEMINGWAY, A. & CAMPBELL, G. S. (1951.) An analysis of normal guinea pig lung for factors determining pulmonary edema and congestion. —*J. Lab. clin. Med.* 37. 143–150. [Authors' summary and conclusions copied *verbatim*.] 2361

Normal guinea pig lungs have been analyzed for quantities which are useful in determining quantitatively the degree of pulmonary edema. In 103 guinea pigs having body weights varying from 180 to 800 grams, lung weight/body weight ratios have been obtained. Approximately seventy normal guinea pig lungs have been analyzed for (1) insoluble protein nitrogen, i.e. protein nitrogen of the tissue framework and parenchyma, (2) hemoglobin, (3) soluble (non-hemoglobin) protein nitrogen, i.e., pulmonary plasma protein, and (4) nonprotein nitrogen. Normal values of these fractions have been obtained and expressed by statistical methods as mathematical functions of lung weight and body weight. Using statistical procedures, correlation coefficients and variations have been determined.

BROWNE, R. C. (1951.) Experimental nystagmus. —*Lancet*. 260. 721–723. [Author's summary copied *verbatim*.] 2362

Four out of six kittens developed rotary nystagmus after being kept in the dark 4–7 weeks. Three of the four recovered after being in daylight for a week. A close-up cinematograph film recorded the results.

These findings confirm the results of experiments made by Ohm (1916) on puppies and by Riesen (1947, 1950) on chimpanzees. They suggest that coalminers' nystagmus may be a type of disuse atrophy of the visual apparatus.

BURSTONE, M. S. (1950.) Studies on the effect of radioactive colloidal gold on the development of the oral structures of the mouse. —*Arch. Path.* 50. 419–426. [Author's conclusions copied *verbatim*.] 2363

The injection of colloidal radioactive gold adjacent to the jaw of the immature mouse will result in abnormalities of osteogenesis and odontogenesis, including failure of root formation. The changes are interpreted as being the result of local irradiation, since the side of the head farther from the injected area exhibits relatively normal development of tooth and bone structure. These changes are similar to those observed in immature mice receiving systemic dosages of radioactive phosphorus. The serous type glands manifest a greater radiosensitivity than the mucous type. The duct elements are relatively radioresistant.

BLATTNER, R. J. & WILLIAMSON, A. P. (1950.) Abnormalities in the beaks of developing chick embryos. —*Arch. Path.* 50. 676–686. [Authors' summary modified.] 2364

In normal chick embryos of 9, 10 and 11 days' incubation which have been killed and allowed to remain at incubator temperatures for eight to 16 hours after death, beak changes develop which may simulate those associated with developmental anomalies. These changes have been found in embryos dying of virus infection, in those dying after paraffin-coating of the shell, which interferes with respiration, in those dying as a result of hemorrhage from a clipped artery, after decapitation and of unknown causes in the normal process of incubation. The beak defects are never found in live embryos or in embryos dead four hours or less, but begin to make their appearance in embryos about eight hours after death, and are well developed by 16 hours after death. The changes occur in beaks of decapitated heads incubated for 24 hours in sterile Ringer's solution. Refrigeration at 15° C. retards the beak changes, but by the sixth day of refrigeration typical changes are observed. No abnormal beaks are observed in embryos kept over night at 15° C., but the changes develop within 24 hours if the embryos are returned to the incubator at 38° C. Gross and microscopic examination of specimens failed to show any disorganized cellular growth. The deformity of the beaks is related to buckling and bending of the beak cartilages. Autolysis of the surrounding connective tissue was a consistent finding. While cellular proliferation occurring after death cannot be eliminated completely as a possible cause, the evidence seems to favor rapid autolysis of supporting structures



as the most satisfactory explanation. Such postmortem autolysis offers a logical explanation also for the prominent beak abnormalities observed in normal embryos which die from unknown causes in the natural course of ontogenesis.

NISSEN, N. I., AAGAARD, K. & FLINDT-HANSEN, E. (1950.) Sulfonamide hematuria. Frequency of injury to the urine tract as estimated on the basis of 6,084 cases treated with different sulfonamide preparations. [Human.]—*Acta med. Scand.* 138. 301-314. [Abst. from authors' summary.] 2365

A survey is given of the frequency of injury to the urinary tract [of human beings] from

sulfonamide therapy in a collective material gathered from the literature.

The writers' own observations covered 6,084 treatments of 4,751 patients. Sulfonamides which are excreted rapidly, e.g. lucosil (sulfamethyl-thiodiazole), show less tendency to damage the kidneys than do preparations which are excreted slowly (e.g., sulfapyrimidine preparations as sulfadiazine and sulfamerazine).

Spontaneous, chemically demonstrable, bleeding from the urinary passages was not infrequent in the course of a severe infectious disease, more often in elderly patients than in younger ones, and damage to the kidneys from sulfa therapy was also encountered more often in elderly patients.

## POISONS AND POISONING

DAHM, P. A., FOUNTAINE, F. C. & PANKASKIE, J. E. (1950.) The experimental feeding of parathion to dairy cows.—*Science*, 112. 254-255. 2366

The insecticide parathion (*o*-diethyl-*o*, *p*-nitrophenyl thiophosphate), used on forage crops, was fed to lactating cows, at two levels, each in excess of the amounts which would be ingested from crops which had been normally treated against insect pests. No parathion was found in nor was flavour imparted to the milk and no harmful effect was observed on the cows, even when, in the case of two cows, the higher dosage level was gradually increased by eight times.—R. MARSHALL.

WEISBERGER, A. S. & HEINLE, R. W. (1950.) The protective effect of cysteine on leucopenia induced by nitrogen mustard.—*J. Lab. clin. Med.* 36. 872-876. [Author's summary copied verbatim.] 2367

Administration of cysteine to rabbits before injecting HN<sub>2</sub> [using a saline solution of mechlorethamine hydrochloride] results in protection against the leucopenia induced with HN<sub>2</sub>. Administration of cysteine immediately after injecting HN<sub>2</sub> does not result in any protection against the leucopenia. Twenty-five milligrams of BAL in oil per kilogram of body weight also did not prevent the leucopenia induced with HN<sub>2</sub>. A marked rise in neutrophils occurs on the second day following the injection of HN<sub>2</sub>. This is similar to that which appears following irradiation. Administration of cysteine prior to the injection of HN<sub>2</sub> does not prevent the typical rise in neutrophils, even though it does prevent the mark leucopenia

which occurs with HN<sub>2</sub>. Possible clinical applications are discussed.

BISKIND, M. S. (1949.) D.D.T. poisoning and the elusive "virus X": a new cause for gastro-enteritis.—*Amer. J. Digest. Dis.* 16. 79-84. 2368

Attention is drawn to the similarities of the syndrome of D.D.T. poisoning and that attributed to infection in human beings with the hypothetical "virus X".

The latter infection, which has been prevalent in the U.S.A. for more than two years, has a symptom-complex of:—acute gastro-enteritis with nausea, vomiting, abdominal pain and diarrhoea, coryza, cough and persistent sore throat, often followed by a persistent feeling of constriction in the throat. Pain in the joints, generalized muscle weakness and paresthesias of various kinds also occur. Evidence indicating association between the "virus X" syndrome and known exposure to D.D.T. is presented.

—H. PAVER.

FAY, R. W., COLE, E. L. & SIMMONS, S. W. (1948.) Toxicity of D.D.T. residues.—*Soap & Sanit. Chem.* 24. 130-133; 157, 159; 189. 2369

The persistence of residual toxicity of D.D.T. spray applications was found to be dependent upon the formulation of the spray and upon the type of surface to which it was applied. In general, persistence was obtained when the solvent or carrier was absorbed by the surface, depositing a layer of D.D.T. in intimate contact.

—W. MOORE.

KOCH-WESER, D., SZANTO, P. B., FARBER, E. & POPPER, H. (1950.) Further investigation on



the effect of vitamin B<sub>12</sub> concentrate upon hepatic injury produced by carbon tetrachloride.—*J. Lab. clin. Med.* 36. 694-704. [Authors' summary slightly modified.] 2370

In confirmation of a preliminary report it was found that in rats intoxicated with carbon tetrachloride there was less bromsulphalein retention, increase in liver weight and total liver lipids, rise in hepatic alkaline phosphatase, and drop in hepatic esterase if they were treated prior to the intoxication with 15 µg of vitamin B<sub>12</sub> concentrate. However, the changes were not entirely prevented. Smaller doses of vitamin B<sub>12</sub> concentrate were not effective.

Histologically, the vitamin B<sub>12</sub> concentrate-treated rats showed less fatty metamorphosis and central necrosis as well as loss of pyroninophilia than untreated rats intoxicated with carbon tetrachloride. However, the reduction in pyroninophilia did not run parallel with the decrease in the content of pentose and total nucleic acids as determined chemically.

Administration of vitamin B<sub>12</sub> concentrate after carbon tetrachloride was ineffective, even with large doses.

Prior administration of vitamin B<sub>12</sub> increased significantly the lethal dose of carbon tetrachloride.

Vitamin B<sub>12</sub> concentrate, therefore, seems to be effective against fatty metamorphosis as well as necrosis produced by carbon tetrachloride. The mechanism of this protective action is not established. The presented studies do not lend support to the original hypothesis of a primary effect upon nucleic acid and are somewhat more in keeping with a pharmacologic vasodilator action. The effect may partly explain reported beneficial effects of liver extracts in hepatic diseases.

HICKS, S. P. (1950.) Brain metabolism in vivo.

II. The distribution of lesions caused by azide, malononitrile, plasmocid and dinitrophenol poisoning in rats.—*Arch. Path.* 50. 545-561.

[Author's summary copied verbatim.] 2371

White rats were poisoned sublethally with sodium azide, malononitrile, plasmocid (8-[3-diethylaminopropylamino]-6-methoxyquinoline), and 2, 4-dinitrophenol, and the distribution of lesions of the nervous system and other organs was determined pathologically by sampling a wide range of tissues. These were compared with the lesions previously reported following sodium cyanide poisoning, insulin hypoglycemia, asphyxia in nitrogen, and poisoning with sodium fluoroacetate. Azide and malononitrile re-

sembled cyanide in a tendency to damage white matter. Plasmocid caused severe necrosis of skeletal muscle and heart muscle and a lesser degree of damage to the trigeminal ganglion. Dinitrophenol damaged skeletal and heart muscle, usually not severely.

Selective lesions are probably brought about in the nervous system and other organs by varying combinations of factors. In the brain, richness of blood supply may be one of the determinants but the general level of metabolic rate as well as qualitative differences of enzymatic pathways used by the tissue seem also to be important. Cyanide, azide and malononitrile may owe their tendency to cause demyelinating lesions to a common factor, the inhibition of cytochrome oxidase, of which white matter has a minimal supply.

Though frequently damaged by those agents that interfered directly with aerobic oxidation of glucose, the heart was never seriously injured by these forms of metabolic inhibition. Its ability to utilize at least three substrates and to some extent alternate metabolic pathways perhaps explains its greater resistance in this respect; but by the same token interference at the metabolic level of convergence of lactate, pyruvate and glucose may cause serious effects.

ANON. (1950.) Birdsville disease of horses. [*Indigofera enneaphylla* poisoning.]—*Aust. vet. J.* 26. 261. 2372

A brief statement is given by a representative committee which was formed to correlate investigations into Birdsville disease of horses. As a result of field investigations it was suspected that the disease was due to the ingestion of the plant *Indigofera enneaphylla*. In feeding trials with 20 horses it was found that the consumption of 10 lb. of the plant per day produced typical symptoms in 20-27 days.—D. F. STEWART.

STEYN, D. G. (1950.) Recent investigations into the toxicity of known and unknown poisonous plants in the Union of South Africa. XVI.—*Onderstepoort J. vet. Sci.* 24. 53-56. 2373

The toxicity of eight plants suspected to be poisonous and one specimen of maize meal infected with *Fusarium moniliforme* was tested in drenching experiments using rabbits and sheep. The only positive result was with *Agave Americana* (American aloe), where the single rabbit used developed paralysis in the hindquarters after receiving 600 ml. of plant juice.—H. PAVER.



## PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific disorders see under the appropriate disease.)

BEELER, J. W., TILLISCH, J. H. & POPP, W. C. (1949.) A new drug in the treatment of radiation sickness.—*Proc. Mayo Clin.* 24. 14th Sept. [Abst. in *S. Afr. med. J.* 25. 87 (1951), slightly modified.] 2374

The authors became interested in the striking similarity between the symptoms of motion sickness and those of radiation sickness. The parallelism between the lassitude, nausea and vomiting, anorexia, and malaise of seasickness and airsickness, and those of radiation sickness, suggested a trial with dramamine [ $\beta$ -dimethylaminoethyl benzohydril ether 8-chlorotheophyllinate]. Dramamine is a drug that is used with good results in seasickness and airsickness.

The authors report their experience with 82 patients, who had radiation sickness in either moderate or severe degree. Marked nausea was present in every case and vomiting in 53 cases. The results in 25.6% of the cases were excellent, 53.7% good, 4.9% fair, and 15.8% were poor.

The authors conclude that dramamine can safely be used as a prophylactic or therapeutic agent in the treatment of radiation sickness.

BEGG, H. & WHITEFORD, H. A. (1950.) The case for direct injection of penicillin into the udder.—*Vet. Rec.* 62. 103–104. 2375

The authors state that disappointment in the use of penicillin in some cases of mastitis in cattle may be caused by an insufficient concentration of the drug available at the actual site of infection, such as may occur if the penicillin is applied *via* the teat canal, as inflammatory changes in the small milk ducts may cause blockage by pus or necrotic tissue and so keep the penicillin from parts of the udder. The authors injected aqueous solutions of penicillin directly into the parenchyma of the udder or into the seat of suspected walled-off foci of disease and claim that this measure yielded some success.—E. EDEN.

GUNNISON, J. B., COLEMAN, V. R. & JAWETZ, E. (1950.) Interference of aureomycin and of terramycin with action of penicillin *in vitro*.—*Proc. Soc. exp. Biol., N.Y.* 75. 549–552. [Authors' summary slightly modified.] 2376

Aureomycin and terramycin interfered *in vitro* with the bactericidal action of penicillin against *Streptococcus pyogenes* and *Klebsiella pneumoniae*. The early bactericidal rate was slower with mixtures of aureomycin or terramycin with penicillin than with penicillin by itself. Ultimately, however, the mixtures were more

likely to destroy all exposed bacteria than were the single antibiotics. Interference was most marked when bacteriostatic concentrations of aureomycin or terramycin were mixed with actively bactericidal concentrations of penicillin.

WOMACK, C. R., KASS, E. H. & FINLAND, M. (1950.) Further observations on a substance in egg yolk which protects aureomycin from deterioration.—*J. Lab. clin. Med.* 36. 655–659. [Authors' summary copied *verbatim*.] 2377

Separation from egg yolk of material which protects aureomycin from deterioration is described. Approximately 99.6 per cent of inactive nitrogenous components were removed. The aureomycin protective fraction is intimately related to the polysaccharide fraction of egg yolk. The protective action of the fraction was demonstrated by colorimetric as well as by microbiologic assay.

VARTIA, K. O. (1950.) Antibiotics in lichens. II.—*Ann. med. Exp. biol. Fenniae.* 28. 7–19. [Abst. in *Bull. Hyg., Lond.* 25. 1061. (1950), slightly modified.] 2378

Nine crystalline lichen acids were tested on eleven species of bacteria. Of them six acids (*d*-protolichesteric, *d*-lichesteric, lichestylic, *l*-usnic, divaricatic and physodic acids) were found to possess unmistakable antibiotic properties against Gram-positive bacteria. The *d*-protolichesteric and *d*-lichesteric acids inhibit slightly the growth of *S. paratyphi B*, *Proteus vulgaris* and *Pseudomonas pyocyanea* too. The fumarprotocetraric and salazinic acids seem to have some slightly retarding effect on the growth of *Ps. pyocyanea*, but no effect on Gram-positive bacteria.

HERTZ, R., ALLEN, M. J. & TULLNER, W. W. (1950.) Effects of amphenone "B" on thyroid, adrenals, and genital tract of the female rat.—*Proc. Soc. exp. Biol., N.Y.* 75. 627–630. [Authors' summary copied *verbatim*.] 2379

Amphenone "B" [1,2-bis-(*p*-aminophenyl)-2-methylpropanone-1 dihydrochloride] administered either orally or parenterally, exerts an atypical trophic action on the genital tract of the ovariectomized female rat. It also effects a rapid hypertrophy of the adrenals and thyroid. These adrenal effects are lacking in the hypophysectomized rat but the uterine stimulation is unaffected either by hypophysectomy or adrenal-ectomy. The compound also possesses an acute



toxicity which is characterized by marked narcosis leading to death. The maximum effective dose is approximately two-thirds of the lethal dose.

DOUGHERTY, T. F. & SCHNEEBELI, G. L. (1950.) **Role of cortisone in regulation of inflammation.**—*Proc. Soc. exp. Biol., N.Y.* **75.** 854–859. [Authors' summary copied *verbatim*.] 2380

By investigation of experimentally induced allergic and traumatic inflammation in (a) adrenalectomized and (b) adrenalectomized and cortisone-treated animals [mice], the role of the adrenals and of exogenous cortical hormone in the regulation of the cellular changes of the inflammatory process was evaluated. Adrenal cortical secretions and exogenous cortisone were demonstrated to inhibit allergic inflammation

through an antiphlogistic action *sui generis*, rather than by interfering with the antigen-antibody union. It is suggested that this antiphlogistic action of cortisone accounts for the capacity of this hormone to minimize the consequences of a wide variety of unrelated inflammation producing stimuli.

STODDARD, R. B. (1948.) **Low pressure aerosols. Their future will probably be determined in 1949.**—*Soap & Sanit. Chem.* **24.** No. 7. pp. 147 & 149. 2381

S. deals with the problems of marketing a new product, in this case "Low Pressure Aerosols", and the probable reaction of public opinion to inferior products and unsound practices.—W. MOORE.

See also absts. 2224 (triethylene glycol vapour); 2229–2230 (ACTH and cortisone); 2231 (thiosemicarbazone); 2232 (cortisone and streptomycin in TB.); 2233 (surface-active agents); 2237 (streptomycin in human glands); 2238 (resistance of *Bact. coli* to sulphonamides); 2242 (chloramphenicol); 2248 (antibiotics in vibronic sterility in cows); 2250 (streptomycin and histoplasmosis); 2255–2260 (trypanosomiasis); 2261–2262 (coccidiosis); 2266 (acaprin); 2287 (antibiotics in distemper complications); 2293 (aureomycin in Q fever); 2294 (chloromycetin in rickettsial infections); 2295 (aureomycin); 2299 (parasiticide); 2301–2304 and 2436 (insecticides); 2302, 2306 and 2368–2369 (D.D.T.); 2305 (tick repellent); 2307 (polonium<sup>210</sup>, selenium<sup>75</sup>); 2309 and 2311 (phenothiazine); 2319 (streptomycin); 2320 (antibacterial agents and growth of pigs); 2323 (aureomycin in pig nutrition); 2333 (tocopherols and "baby pig disease"); 2344 (calf diarrhoea); 2359 and 2370 (carbon tetrachloride); 2365 (sulphonamides); 2366 (toxicity of parathion); 2367 (nitrogen mustard); 2408 (chlorinated hydrocarbon insecticides); 2409 (control of moulds on meat); 2419, 2421 and 2429 (synthetic oestrogens); 2425–2428 (stilboestrol); 2430 (sterility).

## PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

FUJITA, A., KAMINISHI, K., TASHIRO, T., YAMAZAKI, K., SUGANUMA, J. & KISHIDA, T. (1949.) **Studies on aneurinase. 9. On the so-called bacterial aneurinase.**—*Kitasato Arch. Exp. Med.* **22.** 53–56. [Abst. in *Nutr. Abstr. Rev.* **20.** 318, copied *verbatim*. Signed: A. M. COPPING.] 2382

An enzyme obtained from strains of *Bact. coli*, *Staphylococcus aureus*, *Proteus vulgaris*, *Salmonella* sp. and many other bacteria was found to inactivate vitamin B<sub>1</sub>. Its properties were, however, different from those of the destructive enzyme found in raw fish. An exhaustive study of the bacterial enzyme is reported, indicating that it inactivates free vitamin B<sub>1</sub> by a process of phosphorylation. There was no correlation between the vitamin B<sub>1</sub> content of bacteria and their ability to produce the phosphorylating enzyme. A high concentration of vitamin B<sub>1</sub> in the culture medium reduced the activity of the bacterial enzyme. The enzyme had optimum activity at pH 6.5 to 7.0 at a temperature of 37° to 40° C. It was inactivated by heating at 60° to 70° C. for 10 min.

SELIGMAN, A. M., CHAUNCEY, H. H. & NACHLAS, M. M. (1951.) **Effect of formalin fixation on the activity of five enzymes of rat liver.**—*Stain Tech.* **26.** 19–23. [Authors' abst. copied *verbatim*.] 2383

The effect of formalin fixation on the enzymatic activity of five enzymes in rat liver was studied as a function of time and temperature.  $\beta$ -glucuronidase was found to be most resistant to the inactivating effects of formalin. At a time when fixation was satisfactory for preparing frozen sections (24 hours), considerable enzymatic activity was present in decreasing order;  $\beta$ -glucuronidase, sulfatase, acid phosphatase, esterase, and alkaline phosphatase.

OXFORD, A. E. (1951.) **The conversion of certain soluble sugars to a glucosan by holotrich ciliates in the rumen of sheep.**—*J. gen. Microbiol.* **5.** 83–90. [Author's summary copied *verbatim*.] 2384

When *in vitro* fermentations of glucose, fructose or sucrose are carried out under conditions comparable with those in the rumen by means of relatively small inocula of strained rumen contents from hay-fed sheep, the holotrichously ciliated protozoa which are present store immense numbers of microscopic granules consisting of a practically protein-free glucosan giving a purple colour with iodine. The granules can be liberated by bursting the protozoa by the action of the synthetic detergent Teepol XL under mild conditions. An exactly similar polysaccharide granule preparation can be made from protozoa present in the rumen itself if rumen



contents are withdrawn 2-4 hr. after feeding. The yield of iodophilic polysaccharide so obtained may be equivalent to approximately 25% of the weight of water-soluble, yeast-fermentable sugars in a single feed of hay. No granule-filled protozoa are present 9 hr. after feeding.

Other simple sugars such as glucurono-lactone, galactose, mannose, xylose, arabinose, sorbose, lactose, cellobiose and maltose, are not markedly converted into polysaccharide granules by rumen protozoa, during *in vitro* fermentation.

MCCANCE, R. A. & WIDDOWSON, E. M. (1951.) *The metabolism of iron during suckling.*—*J. Physiol.* **112**. 450-458. [Authors' summary copied *verbatim*.] **2385**

The total quantity of iron in the bodies of mice, rats, kittens and pigs increased greatly during suckling. The evidence is that mice, rats and kittens obtained this iron from their mothers' milk, but that piglets obtained most of it from their surroundings. The liver of the rabbit contained unusually large amounts of iron at birth, but this iron was not withdrawn during suckling and since little iron was absorbed the animals became anaemic. The percentage of iron in the liver always fell during suckling but this was partly due to the growth of the organ. Except in the rabbit the total amount in the liver at birth was quite a small fraction of the total body iron. The percentage of the body iron found in the blood of kittens and piglets fell during growth and the percentage in the extra-vascular extrahepatic tissues rose. The healthy human infant should probably increase the iron in its body by some 40% during suckling, and might obtain this iron from its mother's milk.

NIKITIN, V. N. (1949.) [Data relating to the biochemistry of lactation.]—*Biokhimiya*. **14**. 211-218. [Abst. in *Nutr. Abstr. Revs.* **20**. 153. (1950), copied *verbatim*. Signed: R. L. M. SYNGE.] **2386**

With a view to detecting "precursor substances" removed from the blood by the lactating udder, analyses were made with 10 lactating cows, yielding 11 to 31.5 litres per 24 hr., on the plasma of blood simultaneously withdrawn from (1) abdominal aorta, (2) "milk" (anterior mammary) vein and (3) jugular vein 3 hr. after the morning milking. Differences between (1) and (2) were taken as a measure of uptake or output by the udder of the substance in question. Total N, N.P.N., amino-acid N, urea N, reducing substances before and after fermentation by yeast, lipids, acetone  $\beta$ -hydroxy-butyric acid, lactic acid, pH, K, alkali reserve, and ascorbic acid were estimated. The relative

differences were largest for fermentable reducing substances. From the K content of milk and the fall in plasma K it was deduced that 550 litres of blood flowed through the udder per litre milk secreted. This is in substantial agreement with the estimates of other authors made by other means. On this assumption, a balance sheet was constructed for some of the metabolic processes in the udder.

RAGSDALE, A. C., BRODY, S., THOMPSON, H. J. & WORSTELL, D. M. (1948.) *Environmental physiology, with special reference to domestic animals. II. Influence of temperature, 50° to 105° F., on milk production and feed consumption in dairy cattle.*—*Res. Bull. Mo. agric. Exp. Sta.* No. 425. pp. 3-27. **2387**

Milk production, milk fat content and food consumption were studied in cows kept at temperatures between 50°-105° F. The critical temperatures were 75°-80° F. (Holstein) or 80°-85° F. (Jerseys) when milk production and food intake started to fall and fell progressively until at about 105° F. they stopped. Return to temperatures of 50°-60° F. reversed both effects. —P. H. HERBERT.

VAN ZIJL, W. J. (1951.) *Het precordiale electrocardiogram bij het paard. [The precordial electrocardiogram in the horse.]*—*Tijdschr. Diergeneesk.* **76**. 226-231. [English, French and German summaries, abst. from English summary.] **2388**

Precordial electrocardiograms were taken from ten different places on the thorax of a horse. The findings suggested that the excitation wave reached the right ventricle first, and then the left ventricle. The use of these electrocardiograms in clinical investigations is discussed.

LANNEK, N. (1947.) *Bidrag till kännedomen om hundens normalelektrokardiogram. [The normal electrocardiogram of the dog.]*—*Skand. VetTidskr.* **37**. 385-421. [English summary.] **2389**

Using an amplifying electrocardiograph with subcutaneously inserted needle electrodes and a technique which is described in detail, L. studied the electrocardiogram in 51 dogs of 17 breeds. The findings were recorded in great detail, among the more important ones being:

The maximum duration of the QRS complex is 0.06 sec.; the maximum duration of the PQ interval is 0.15 sec.; the maximum duration of the QT interval is 0.22 sec.; the maximum amplitude of the P wave is 4 mm.; the minimum amplitude of the T wave in leads I, II and III is -4mm. and its maximum amplitude in lead IV is +12 mm.—F. E. W.



WILSON, R. H. (1951.) pH of whole arterial blood.—*J. Lab. clin. Med.* 37. 129–132. [Author's conclusions copied *verbatim*.] 2390

The pH of whole blood can be measured accurately with the glass electrode. The temperatures of the blood and glass electrode must be the same during the determination. Measurements of the pH should be done immediately at 37.5° C., or if this is not convenient an extrapolation method may be used. A constant-temperature cabinet has been described for maintaining the glass electrode and buffer solution at 37.5° C.

SLOVITER, H. A. (1951.) Recovery of human red blood-cells after freezing.—*Lancet*. 260. 823–824. [Author's summary copied *verbatim*.] 2391

Human blood has been rapidly frozen and rapidly thawed in the presence of glycerol, as previously described by Smith (1950). The removal of glycerol from the red blood-cells (a necessary procedure for further utilisation of the cells) has been successfully accomplished by dialysis. Using 5 ml. quantities of human blood, recoveries of 80% to 90% of the red blood-cells have regularly been obtained following freezing and thawing, dialysis, and re-suspension in plasma. The recovered cells appeared to be normal. Some of the experimental factors of importance in the procedure have been evaluated.

LEWIS, A. E. & GOODMAN, R. D. (1950.) The excretion kinetics of the dye T-1824 in relation to plasma volume determinations.—*J. Lab. clin. Med.* 36. 599–603. [Authors' summary and conclusions slightly modified.] 2392

The authors described a method for the measurement of plasma volume using a constant infusion of the dye T-1824. Since this calculation of plasma volume is based on rates of change in plasma concentration, the possible effects of mixing time are eliminated. In rabbits the error introduced by neglecting mixing time is negligible. The data indicate that in rabbits there is no significant difference in calculating plasma volumes by linear or exponential extrapolation. The excretory rate of T-1824 in rabbits is so low that estimations of clearance or maximum excretory rate are invalidated by relatively small experimental errors.

UNGAR, G. & DAMGAARD, E. (1951.) Studies on the fibrinolysin-antifibrinolysin system in serum. I. Action of the anterior pituitary, adrenal cortex, and spleen.—*J. exp. Med.* 93. 89–97. [Authors' summary copied *verbatim*.] 2393

Injection of ACTH or cortisone has no effect on the amount of fibrinolysin resulting from the activation of profibrinolysin by peptone. Antifibrinolytic activity of serum is significantly increased by ACTH or cortisone but not by desoxycorticosterone or corticosterone. No increase in antifibrinolytic power of serum is produced, however, by the injection of ACTH or cortisone in splenectomized guinea pigs. Splenin A [substance produced by the spleen] has the same action on fibrinolysin inactivation as ACTH or cortisone. Splenin B [substance produced by the spleen] has the opposite effect. This action on the antifibrinolytic power of serum appears to be due to an acceleration of the rate of combination between the enzyme and its inhibitor and not to an actual increase in antifibrinolysin. The possible significance of these observations is discussed.

TRAUTMANN, A. & HILL, H. (1949.) Temperaturmessungen im Pansen und Labmagen des Wiederkäuers (Ziege). [Temperature measurements in the rumen and abomasum of goats.] —*Pflügers Arch.* 252. 30–39. [Abst. in *Nutr. Abstr. Rev.* 20. 361, copied *verbatim*. Signed: A. T. PHILLIPSON.] 2394

The temperature variation of the interior of the rumen and abomasum of goats was measured by inserting the sensitive element of a thermoelectric couple into these organs through cannulae. Temperatures were recorded over 24-hr. periods; the temperature inside the abomasum was found to exceed that in the rumen by 0.4° to 2.0° C. Rectal temperatures were within  $\pm 0.1^\circ$  C. of the abomasal temperature.

Temperatures in both parts of the stomach were higher in the afternoon than in the night or morning. Consumption of hay caused an increase of rumen temperature by 2.0° C. but only a small increase of abomasal temperature, 0.2° to 0.4° C. Drinking or introduction of water by stomach tube caused a fall of temperature in both organs, greater in the rumen.

MEITES, S., BURRELL, R. C. & SUTTON, T. S. (1951.) Factors influencing the *in vitro* digestion of cellulose by rumen liquor in the presence of an antiseptic.—*J. Anim. Sci.* 10. 203–210. [Authors' summary copied *verbatim*.] 2395

Cellulose digestion may be demonstrated by the *in vitro* action of rumen liquor on filter paper in the presence of toluene, through the accumulation of reducing substances.

Toluene proved to be the most effective antiseptic to prevent further changes of the reducing substances which are first produced



in cellulose digestion. The optimum pH lies between 4.53 and 7.35. Phosphate and glycine buffers appeared to be more favourable than borate or citrate. Anaerobic conditions are not essential. The cellulolytic activity of rumen liquor, with or without added buffer, decreases on standing in the presence of toluene, and ceases after about 48 hours.

The factors which promote digestion of cellulose by rumen liquor do not appear to pass through a Berkfeld filter.

The loss of cellulolytic activity of rumen liquor on dialysis cannot be restored by the addition of various vitamin mixtures, yeast, beef and alfalfa extracts, bovine blood, evaporated dialyzate, or boiled or filtered rumen liquor. Some of the activity may be restored by the addition of solutions of ashed alfalfa hay and of rumen liquor.

MOIR, R. J. & WILLIAMS, V. J. (1950.) **Ruminal flora studies in the sheep. II. The effect of the level of nitrogen intake upon the total number of free microorganisms in the rumen.**—*Aust. J. sci. Res. Ser. B.* 3. 381–392. [Authors' summary copied verbatim.] 2396

A method of obtaining ruminal samples for the investigation of the "free" microorganisms of the sheep's rumen by means of a stomach-tube is described.

The total numbers of microorganisms per unit volume obtained in this way were found to be lower than in samples taken directly from whole-rumen contents. The correlation between the counts for the two series of samples and the constancy of the difference is considered to justify the stomach-tube method as a means of assessing changes in the number of microorganisms in the rumen.

The data are presented from a feeding trial designed to determine the effects of varying intakes of protein upon the number of ruminal microorganisms. In this trial five sheep were fed five levels of protein derived from casein and oat hay. The levels of protein consumed were approximately 3, 6, 9, 10, and 12 per cent. of the dry matter of the ration.

An extremely high correlation ( $r = +0.98$ ) was found between the levels of intake of protein and the numbers of microorganisms in the rumen. It was concluded that, under the conditions of the experiment, the number of organisms was determined by the protein intake.

The regressions for the numbers of organisms against protein nitrogen are presented. These indicate that a relatively constant proportion of the ingested protein (of the order of 50 per cent.) was converted to bacterial protein.

These findings, together with the "true" digestibility and biological value of the protein of each ration, are discussed in relation to protein metabolism in the ruminant.

MACKLIN, C. C. (1951.) **The dust cells in the lungs of the albino mouse. Their structure, relations, and mode of action.**—*Lancet.* 260. 432–435. [Author's conclusions copied verbatim.] 2397

Alveolar dust cells under normal conditions are attached to the alveolar walls by insertion into pores or sockets. From the environing capillaries of these emplacements they derive their nutriment. When spent they become free and are disposed of via the bronchial tree. They never enter the connective tissue of the lung, and hence are never found in the lymphatic system. They are of endodermal origin and thus are epithelial in type. They are not to be confused with the histocytes of the connective tissue of the lung, which often take up dust particles which have adventitiously penetrated the alveolar walls.

Alveolar dust cells are readily dislodged from the alveolar walls by collapsing the lung. Their vacated sites of attachment in partitioned alveolar walls are known as pores. They also become free in the presence of fluid in the alveoli, and gradually after experimental exposure to dust such as that of carmine granules. They may have as many as four air faces or particle receptors, and these may extend as thin flanges over neighbouring capillaries.

To display them in normal relation to the alveolar wall an adequate fixation technique is imperative, such as prompt immersion of the fresh skinned unopened thorax in Bouin's or Regaud's fluid.

GOEBEL, A. (1949.) **Das Verhalten von Sphingomyelinen im Tierkörper. [Behaviour of sphingomyelins in the animal body.]**—*Biochem. Z.* 319. 196–202. [Abst. in *Nutr. Abstr. Rev.* 19. 951. (1950), copied verbatim. Signed: W. GODDEN.] 2398

Sphingomyelin in 10 per cent. colloidal solution in 0.9 per cent. saline was injected intravenously in varying amounts into rabbits and mice and blood and organs were examined at intervals. After a short rise the sphingomyelin disappeared from the blood in a time depending on the amount injected. It was found mostly in the liver and to a smaller extent in the spleen, kidneys and lungs, but the amount recovered decreased rapidly with lapse of time. Judging by the rise in acid-soluble P found in the blood, the breakdown of sphingomyelin resulted in liberation of phosphoric acid.



GOEBEL, A. & SECKFORT, H. (1949.) Über Spaltung von Sphingomyelinen durch Organe. [**Splitting of sphingomyelins by organs.**]—*Biochem. Z.* 319. 203–208. [Abst. in *Nutr. Abstr. Rev.* 19. 954. (1950), copied *verbatim*.] Signed: W. GODDEN.] 2399

Sphingomyelin in colloidal solution in 0.9 per cent. saline, suitably buffered, was incubated at 37° to 38° C. with the press juice from organs of different animals. Breakdown was demonstrated only with liver and brain, and the optimum pH values were 7.2 and 6.2, respectively. The end-point was reached after 12 hr. with liver and after 36 hr. with brain, the only decomposition product detected being phosphoric acid.

OPIE, E. L. & ROTHBARD, M. B. (1950.) The movement of water in interstitial tissue and in muscle removed from the body.—*Arch. Path.* 50. 800–812. [Authors' conclusions copied *verbatim*.] 2400

When dense fibrous tissue like that of corium of the skin, wall of the aorta or tendinous fascia of muscle is immersed in solutions of sodium chloride, it swells by hydration; it takes up water in both weak and strong solutions of sodium chloride, in Ringer's solution and in blood serum. In striated muscle under the same conditions movement of water occurs (1) by hydration of the fascial framework and (2) by osmotic interchange between muscle fibres and the surrounding fluid. Interchange of water in heart muscle and in smooth muscle of the uterus similarly immersed is, under usual conditions, chiefly by osmosis. The water of interstitial tissue is normally in such relation to colloids that it is not freely movable in tissue spaces.

DAWSON, F. L. M. (1950.) The microbial content and morphological character of the normal bovine uterus and oviduct.—*J. agric. Sci.* 40. 150–156. [Author's summary modified.] 2401

The genitalia of a control series of nineteen animals, slaughtered for other reasons than reproductive failure, were studied. Of these, six were in various stages of pregnancy, one probably just before the first oestrus after calving, and twelve represented different phases of the oestrous cycle, more than half exemplifying the last 4 days before heat. Stages were judged from the appearance of the ovaries, and checked in five instances by repeated rectal examinations, and observation of behaviour during life. Of the nineteen uteri eight yielded bacteria on culture, sometimes in moderately high density; from two of them, pure cultures were recovered respectively of *Pseudomonas* and *Neisseria catarrhalis*; and in another, probably *Proteus* was found. D.

considers that the sanguineous elements in post-oestral discharge originated from endometrial extravasation. Microscopically, no mast cells, as observed by the Italian workers, could be seen; it appeared that a 'proliferative phase' occurs in every cycle during the three pre-oestral days, when gland tissue proliferates from its nadir of development, surface epithelium grows in height, and vascularization progresses. Arterioles appeared to be withdrawn from the superficial mucosa during the secretory phase.

AJELLO, P. (1950.) Osservazioni sulla citologia del secreto vaginale durante il ciclo sessuale della capra Siciliana. [**Cytology of the vaginal secretion during the oestrous cycle in Sicilian goats.**]—*Nuova Vet.* 26. 226–232. 2402

Fifty Sicilian goats which kidded from January to March came into oestrus over a period ranging from April to September. In 44 the oestrous cycle covered a period of 8 days, in the others from 5–15 days. Oestrus lasted 49–50 hours with a range of 24–60 hours. Vaginal smears were studied in 24 animals but the changes were too irregular to be of any diagnostic value of the phase of the oestrous cycle.

—A. T. COWIE.

SCACCINI, A. (1950.) Sulla genesi della vagina nella coniglia. [**Embryology of the vagina in rabbits.**]—*Nuova Vet.* 26. 238–240. 2403

The vagina in the rabbit is almost entirely derived from the müllerian ducts, the epithelium of the wolffian ducts playing no part in the formation of the vagina as in many other species.—A. T. COWIE.

IRWIN, J. O. (1950.) Biological assays with special reference to biological standards.—*J. Hyg. Camb.* 48. 215–238. 2404

A brief history and a list of the International Biological Standards are given. A biological standard is defined together with potency and unit. These are necessary only where products cannot be synthesized and thus assayed chemically or physically. Statistical technique for interpretation of results is provided, with examples. The international assays of the vitamin D are described, leading to the suggested adoption of vitamin D<sub>3</sub> as the standard.

—JOHN SEAMER.

MORTON, F. (1951.) Properties and limitations of a cation-exchange resin. Laboratory investigation of Zeo-Karb 225.—*Lancet.* 260. 825–827. [Author's summary copied *verbatim*.] 2405

The cation-exchange resin, 'Zeo-Karb 225,' has been examined quantitatively with regard to its exchange efficiency towards sodium, potassium,



and calcium ions under various conditions. The resin shows a very high relative affinity for calcium, a lower one for potassium, and a much lower one for sodium. Presaturation of the resin with calcium and potassium gave products whose exchange efficiency for sodium was poor. Magnesium trisilicate is capable of eliminating

acid produced during cation exchange, but it was found to cause a well-marked loss of efficiency of the resin. An in-vitro experiment simulating the mineral conditions in the alimentary tract was devised in order to study the effect on cation exchange of the great preponderance of sodium ions.

*See also absts.* 2334-2336 (uterine changes in vitamin E deficient rats); 2465 (dictionary of anatomical terms); 2466 (book, P.M. examination).

## PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

ANON. (1949.) **The provision of safe milk of high quality. Report of the Joint Committee of the British Medical Association and National Veterinary Medical Association.**—*Vet. Rec.* 61. 832-837. 2406

The Joint Committee is agreed that the fundamental requirements for providing safe milk of high quality can only be met by the promotion of healthy herds, in particular those which are TB. free, and by efficient pasteurization.

Milk production methods may adversely affect the health of the consuming public because the milk may carry pathogenic organisms of bovine or human origin, or the quantity produced may be lowered.

Mortality in young stock can be extremely high and is largely the result of diseases associated with faulty management and nutrition; infertility is responsible for enormous under-production of milk and calves; and mastitis was estimated to be responsible for a loss of 48 million gallons of milk in 1940. Eradication of bovine TB. by the Ministry of Agriculture is expected, but it must be spread over a period of years, for the general slaughter of reactors would not be immediately practicable as the output of milk would be seriously reduced. However, the attested Herds Scheme should be extended as rapidly as possible, and the question of branding and segregation of reactors should be further explored. All milk from reactors should be heat treated, and the number of designated classes of milk should be reduced to two—Tuberculin Tested and Pasteurized. Sterilization of milk should be recognized only as a temporary measure, and the designation "accredited" should be abandoned forthwith.

The structure for the administration of the acts relating to production becomes more complex under this new legislation. The responsibility for making regulations is now spread between the Ministers of Health, Agriculture and Food, acting jointly. This appears to be a sensible arrangement, but might also create a defensive system in Parliament. A central Milk and Dairies Advisory Committee is to be ap-

pointed by the Minister of Agriculture in consultation with the Ministers of Health and Food to give uniformity, but it is to be followed immediately by decentralization in the creation of county executive and advisory committees. This new legislation has also brought into being many new officers, authorities and committees. Will the new machinery prove efficient and not unduly wasteful in the use of manpower, and will there be a full measure of co-operation between the numerous bodies concerned? The staffing problem would seem to be insoluble owing to the shortage of skilled staff. It must also be realized that the increased demand for milk has resulted in nationalization of marketing which means that the consumer cannot buy from the milk distributor of his choice, and the distributor cannot select the farmers from which to purchase his milk. The standard of milk production would be raised if these restrictions were removed.

The Veterinary Officer's responsibility will be confined to matters directly affecting the health of cattle, and will not include environmental factors, although these may influence the health of herds. The quality and quantity of water available on dairy farms and other sections of the dairy industry is a vital factor relating to the spread of infectious disease. To ensure the provision of a safe milk supply for small towns and villages, milk samples for testing should be regularly taken from producer-retailer herds, and routine veterinary inspection made at stated intervals. Also the speed in the delivery of milk should be considered, all Grade C milk should be rejected, and milk testing should be co-ordinated and controlled.—J. O. L. KING.

LUDLAM, G. B. & HEMINGWAY, H. (1950.) **Note on the routine use of *p*-nitrophenylphosphate as the substrate in the milk phosphatase test.**—*Mon. Bull. Min. Hlth publ. Hlth Lab. Serv.* 9. 280-281. [Authors' summary and conclusions slightly modified.] 2407

One thousand pasteurized milk samples were examined for phosphatase activity by both



the Kay-Graham test and the Aschaffenburg-Mullen test; a close correspondence was found between the results of these two tests. If further work confirms these results the Aschaffenburg-Mullen test, because of its speed and simplicity, might well partly or completely replace the Kay Graham test for the routine testing of pasteurized milk.

BUSHLAND, R. C., CLABORN, H. V., BECKMAN, H. F., RADELEFF, R. D. & WELLS, R. W. (1950.) Contamination of meat and milk by chlorinated hydrocarbon insecticides used for livestock pest control.—*J. econ. Ent.* 43. 649-652. [Authors' summary copied verbatim.] 2408

Three years' studies on the effects of sprays and dips of DDT, TDE, methoxychlor, chlordane, toxaphene, lindane, and technical benzene hexachloride are reviewed. All the insecticides, when applied to livestock as sprays or dips, were absorbed and stored in the fat. Data are given on the circumstances, extent, and duration of such storage. The insecticides for which sufficiently sensitive analytical methods have been developed were also found in the milk of treated cows. The spraying of dairy barns with DDT or TDE for fly control resulted in milk contamination unless special precautions were taken.

WOLF, F. T. & WOLF, F. A. (1950.) Chemical agents for the control of molds on meat.—*Mycologia*. 42. 344-366. [Abst. from abst. in *Rev. appl. Mycol.* 30. 59. (1951.)] 2409

Experiments were carried out on 31 chemical agents for the control of mould spoilage of meats. The test fungi were *Penicillium crustosum*, *P. cyaneum*, *P. cyclopium*, *P. martensii*, *P. olivino-viride*, *P. waksmani*, *Aspergillus niger*, *A. sydowi*, *Cephalosporium* sp., *Hormodendrum cladosporioides*, and *Thamnidium chaetocladioides*, all isolated from meats and meat products in cold storage. The minimum fungistatic concentration of each chemical was determined for each test organism. The chemicals with the greatest merit were found to be acetic acid 0.2 per cent., sodium diacetate 0.75, sodium caprylate 0.3, sodium undecylenate 0.1, methyl *p*-hydroxy benzoate 0.1, *n*-butyl *p*-hydroxy benzoate 0.02, thymol and oil of cloves 0.025 to 0.05, tetrachlorobenzoquinone 0.005 to 0.01, dichloronaphthoquinone 0.005 to 0.01, crotonic acid 0.1 to 0.15, sorbic acid 0.1, and trichlorophenyl acetate 0.005.

FISH, C. H. & SPENDLOVE, G. A. (1950.) Safety measures in a tuberculosis laboratory.—*Publ. Hlth Rep., Wash.* 65. 466-467. [From sum.] 2410

[This is a detailed set of instructions for institutions, giving item by item the measures that require to be enforced to prevent a laboratory infection.—Ed. V.B.]

In the Tuberculosis Laboratory Unit, Communicable Disease Center, Public Health Service, certain safety procedures have been formulated which are presented here.

1. Thorough instruction is given in (1) aseptic technique; (2) methods of handling specimens, cultures, and animals; (3) methods of avoiding contamination of self, others, and surroundings; and (4) methods of decontamination of self and surroundings.

2. An exhaust hood equipped with ultra-violet light, exhaust fan, and sterilizer, is provided for transfer of cultures. Ultra-violet light in the hood is turned on for 10 minutes before and after transfer of cultures.

3. Medical and health programme. Details are given.

4. Use of equipment:—

(a) The use of mouth pipettes in contaminated rooms is prohibited. (b) Sterile masks are worn during transfer of cultures. Masks are disposed of as contaminated material after use. (c) Rubber gloves, masks, and goggles are worn while doing animal inoculations and autopsies. (d) Grinding of dry pathogenic mycobacteria in an open container is prohibited. (e) Needles and syringes are checked for defects before use. Only "Luer-Lok" syringes are used for animal inoculations.

5. Handling of animals:

(a) Animals are autopsied on metal trays to prevent contamination of tables. (b) Animal inoculations and autopsies are done behind a plexi-glass screen for protection against accidental contamination of clothing. (c) Discarded autopsied animals are wrapped in wax paper and incinerated.

6. Rooms where specimens are received, cultures transferred, infected animals are housed, and where animals are inoculated and autopsied, are considered contaminated, as are the outsides of containers of specimens, needles, syringes, metal trays, and all objects used in the transfer of cultures.

7. Decontamination procedures:

(a) Needles, syringes, and metal trays are autoclaved before washing. Instruments are boiled before washing. Large equipment and stationary objects, if contaminated are kept in contact with 5% saponated cresol for 30 minutes. Infected material is discarded in a splash-proof can. (b) Floors are swept with a dust reducing compound and mopped daily with hot soapy water containing 5% cresol. (c) Table tops are



swabbed daily, after work, with 5% saponated cresol or with 70% alcohol.

#### 8. Personal procedures:

(a) Short sleeved laboratory coats are worn in contaminated rooms. (b) Laboratory coats are removed before leaving contaminated rooms. (c) Contaminated hands are washed for 2 minutes with soap and water, rinsed with 70% alcohol, and allowed to dry in air. (70% alcohol dispensers are situated in convenient locations.)

#### 9. Miscellaneous:

(a) Safety signs (NO SMOKING, CONTAMINATED

AREA, REPORT ACCIDENTS IMMEDIATELY) are situated in easily discernible locations. (b) No smoking is allowed in contaminated rooms. (c) Laboratory rooms are draft free, air-conditioned, and adequately lighted. (d) Adequate rest-room facilities are provided. (e) Shower facilities are provided for those personnel handling infected animals and cleaning infected animals cages. (f) First-aid kits and fire extinguishers are easily available and are inspected periodically. (g) Care is taken to avoid skin contact with cresols and streptomycin in order to avert sensitivities.

See also absts. 2242 (salmonella infection from duck eggs); 2269 (rabies control); 2460 (report, Germany).

## REPRODUCTION AND REPRODUCTIVE DISORDERS

SCHMIDT, K., DIETZ, O. & WEISS, H. (1950.) Künstliche Besamung von Ziegen. [Artificial insemination of goats].—*Berl. Münch. tierärztl. Wschr.* No. 6. pp. 109–112. 2411

The technique of semen collection and insemination of the goat is described. Of 252 goats inseminated in one breeding season, 199 became pregnant at first insemination, 46 received two inseminations, 5 received three, and 2 received four. In all 233 became pregnant.

—A. T. COWIE.

MACLEOD, J. & MCGEE, W. R. (1950.) The semen of the Thoroughbred.—*Cornell Vet.* 40. 233–248. 2412

Semen examinations on 23 American Thoroughbred stallions were made over two breeding seasons. Complete ejaculates were obtained by fitting special condoms to the stallions. The mean volume of the ejaculate was 60 ml. (range 30–110 ml.). The spermatozoa count averaged 234 million per ml. but the range was wide—10–635 million. Spermatozoa activity fell off rapidly and there was little present after eight hours at room temperature. The pH of the ejaculate was 7.4 (range 7.2–7.8). The reducing properties of stallion semen were low compared with that of bull semen, indicating that if any sugar is present it can only be in very small quantities. The metabolic activity of the spermatozoa was low as measured by the Warburg technique. There appeared to be no correlation between metabolic activity and fertility except in the case of spermatozoa from two sterile stallions which had no metabolic activity of any kind. It is concluded that stallion spermatozoa are more fragile than spermatozoa of most other domestic animals.—A. T. COWIE.

ROTHSCHILD. (1950.) Electrical measurement of bull sperm activity. Comparison with visual

assessment.—*J. agric. Sci.* 40. 82–83. [Author's summary copied verbatim.] 2413

The visual method of assessing the quality of semen, in use at Artificial Insemination Centres, has been compared with assessments based on measurements of impedance change frequency (I.C.F.) on the same samples. Analysis of the results shows that I.C.F. measurements could probably be substituted for visual assessments at A.I. Centres, without conception rates being adversely affected.

WILLET, E. L. & BUCKNER, P. J. (1951.) The determination of numbers of spermatozoa in bull semen by measurement of light transmission.—*J. Anim. Sci.* 10. 219–225. [Authors' summary copied verbatim.] 2414

Five different procedures for determining spermatozoan numbers by measurement of light transmission with a Cenco-Sheard-Sanford Photometer were compared. It was concluded that the most accurate and practical method consisted of the addition of 4 cc. of sodium citrate buffer to 0.1 cc. of semen and the making of the readings with the diluted semen in a standardized tubular absorption cell 17 mm. in diameter.

Haemocytometer counts and light transmission readings using this method were made with 142 samples from 50 bulls in 3 studs. A correlation of  $-0.97$  between logarithms of Photometer readings and haemocytometer counts was obtained. The regression coefficient was  $-0.28$ . There were no significant differences between the within-bull correlation or regression coefficients.

A comparison of readings made on nine Photometers with five semen samples in duplicate indicated that an instrument would not need to be calibrated if it were to be used



in a bull stud but that it should be if maximum accuracy, such as that required in some research work, is desired.

Different sources of variation when comparing haemacytometer counts with counts estimated by means of light transmission values were determined. Duplicate readings by both methods were made with 25 ejaculates from 20 bulls. It was found that the Photometer will give more reproducible readings for any given semen sample than will the haemacytometer. The main source of error when comparing the two methods is variation in the inherent properties of the seminal plasma or spermatozoa which cause variation in light transmission readings independent of spermatozoan numbers.

MAYER, D. T., SQUIERS, C. D., BOGART, R. & OLOUFA, M. M. (1951.) **The technique for characterizing mammalian spermatozoa as dead or living by differential staining.**—*J. Anim. Sci.* 10. 226–235. [Authors' summary copied *verbatim*.] 2415

A staining technique has been described which separates mammalian spermatozoa into two groups; viz., stained or dead cells and unstained or presumably live cells. The differential staining technique has been shown to be applicable to human, ram, bull, rabbit, and stallion spermatozoa. A substance present in the semen plasma of the boar interferes with the differential staining of the spermatozoa of this species. The water-soluble halogen derivatives of fluorescein were the only dyes studied capable of differentially staining mammalian spermatozoa. A new background stain, fast green FCF has been investigated and found superior to opal blue for this purpose. Studies with the staining principle have shown that differential staining is dependent upon the presence of ionizable substances and that the pH must be held within a narrow range for optimal staining results.

ROY, A., BHATTACHARYA, S., LUKTUK, S. N. & BHATTACHARYA, P. (1950.) **Studies on the reducing substances of semen. II. Relation of sperm concentration and semen volume to fructose content fructolysis and methylene-blue time reduction.**—*Curr. Sci.* 19. 52–53. 2416

In this preliminary note the authors reported the relationship of spermatozoa concentration per ml., total volume, and total number of spermatozoa per ejaculate of ram semen to fructose content (mg. per 100 ml.), fructolysis and methylene-blue reduction time (MBRT). Spermatozoa concentration per ml. was positively correlated to fructolysis but negatively to fructose content and MBRT. The fructose con-

centration had a direct relationship to the total volume. Individual variations in the relationship of the different seminal characteristics were also observed.—S. GUHA.

PINCUS, G. & SHAPIRO, H. (1940.) **The comparative behavior of mammalian eggs *in vivo* and *in vitro*. VII. Further studies on the activation of rabbit eggs.**—*Proc. Amer. phil. Soc.* 83. 631–646. [Authors' abstr. modified.] 2417

Rabbit eggs were obtained in large numbers by a technic of superovulation, and washed out of the uterine tubes, with sterile solutions. The eggs were exposed to various agents, in order to activate them parthenogenetically. These included hypotonic balanced salt solutions, hypertonic followed by hypotonic solutions, exposure to cold. Ova were considered activated if they showed clear pronuclei, or cleavage chromosomes, or underwent true cellular division. Some of the eggs showed excellent mitotic figures which are illustrated and others segmented into 2, 3 or more perfect blastomeres. The eggs subjected to cooling yielded the greatest percentage of activation.

Attempts were also made to activate the eggs *in vivo*, by inserting a loop of the Fallopian tube containing eggs recently ovulated by the same animal, into a metal jacket, through which cold water could be circulated. This treatment activates eggs *in situ*. The animals were allowed to recover, and go to term. One of the does so treated gave birth to a daughter of normal appearance and behaviour.

BENZIE, D. (1951.) **X-ray diagnosis of pregnancy in ewes.**—*Brit. vet. J.* 107. 1–6. [Author's summary copied *verbatim*.] 2418

Accurate radiological diagnosis of pregnancy in the ewe is possible by the 55th day of gestation using suitable equipment and the technique described.

Radiographs from the 55th day to the 100th day of gestation are presented demonstrating the appearance of the foetus.

CHARLES, G. (1948.) **Induction of oestrus in ewes using synthetic oestrogen.**—*Yearb. Inst. Insp. Stk., N.S.W.* 1948. pp. 69–70. 2419

CHARLES, G. (1949.) **Induction of oestrus in ewes using synthetic oestrogen.**—*Ibid.* 1949. p. 57. 2420

C. reported an experiment involving 60 Corriedale ewes. Treatment consisted of a single intramuscular injection of 3 mg. diethylstilboestrol in oily solution into each of 40 ewes, administered in December when most ewes in the district are reported to be anoestrous. The

remaining 20 ewes were untreated controls. All the ewes were placed in a paddock with two raddled rams, and observed daily for 36 days.

Three days after treatment ten ewes mated, as shown by raddle marks on the rump; 17 days later eight of these mated again, and four other ewes also mated. At 36 days after injection four ewes mated again. During the whole period none of the control ewes mated.

About five months later three ewes lambed, having apparently conceived at the second oestrus after injection.—C. R. AUSTIN.

CALISTI, V. (1950.) L'aborto da estrogeni sintetici nella pecora. [Abortion in sheep caused by synthetic oestrogens.]—*Arch. Vet. Ital.* 1. 15–25. [English, French, German and Spanish summaries. Abst. from English summary.] 2421

C. carried out experiments to test the abortive action of synthetic oestrogens on sheep. He found that the administration of diethyldioxystilbene dipropionate in doses ranging from 3–150 mg. was effective, depending on the stage of the pregnancy. The expulsion of the foetus may be followed during the last months of gestation by manifestations of septic metritis deriving from an infection caused by the micro-organisms introduced into the uterine cavity.

Endometrial alterations subsequent to the administrations of high oestrogen doses are favourable to the establishment of such infections; their gravity increases with the advancing pregnancy. The mechanism of abortion induced by oestrogens is discussed.

BASSETT, E. C. & SEWELL, O. K. (1951.) Excretion of oestrogens in the urine of non-pregnant ewes during the breeding season. [Correspondence.]—*Nature, Lond.* 167. 356–357. 2422

The authors confirmed the findings of Whitten (1943) and Beck (1950) on the presence of oestrogens in the urine of pregnant ewes. They found also that there was oestrogen excretion in the urine during the oestrous period. This active substance gave a result in test mice approximately equivalent to that obtained by the administration of 1.75 I.U. of oestrone.

—G. M. GLAS.

NICOL, T. & HELMY, I. D. (1951.) Influence of oestrogenic hormones on the reticulo-endothelial system in the guinea pig. [Correspondence.]—*Nature, Lond.* 167. 199–200. 2423

The effects of six common oestrogens on the reticulo-endothelial system of the ovariectomized g. pig were studied, and measured by the phagocytosis of trypanblue. Hyperplasia and stimula-

tion of the macrophages occurred most markedly in spleen, liver, uterine horn and lymph gland. Stilboestrol dipropionate in daily doses of 0.1 mg. was found to be the most active preparation. Large doses (5 mg. daily) appeared to increase the number of macrophages in the uterine horn at the expense of other tissues.

—JOHN SEAMER.

WHITTEN, W. K. (1950.) Inactivation of gonadotrophins. III. Inactivation and modification of serum gonadotrophin by periodate ions.—*Aust. J. sci. Res. Ser. B.* 3. 346–355. 2424

W. found that serum gonadotrophin was partially inactivated by incubation with dilute solutions of potassium periodate. The residual activity produced a relatively greater degree of luteinization than was obtained with comparable doses of untreated hormone in normal and hypophysectomized rats. The residual activity was not inactivated by influenza virus.

The inactivation of the hormone by periodate was not due to changes which permitted the excretion of the hormone. Unlike luteinizing hormone and chorionic gonadotrophin, the treated serum gonadotrophin produced significant growth of the ovaries of hypophysectomized rats.—W. P. ROGERS.

PEISLEY, H. R. (1949.) Stilboestrol trial for earlier lambs.—*Yearb. Inst. Insp. Stk., N.S.W.* 1949. pp. 47, 49, 51–53 & 55. 2425

P. discussed the literature briefly, and described a field trial. A single injection of stilboestrol during the anoestrous period in young maiden ewes resulted in 12% lambing. Controls produced only 1% of lambs. [See also *V.B.* 20. 47.]—H. McL. GORDON.

BISHOP, P. M. F., RICHARDS, N. A. & PERRY, W. L. M. (1951.) Stilboestrol sulphate, oestrone, and equilin. Further observations on the potency and clinical assessment of oestrogens.—*Lancet.* 260. 818–820. [Authors' summary copied verbatim.] 2426

A method is described for comparing the potency of oestrogens in man. It consists in giving the oestrogen daily by mouth in fourteen-day courses to amenorrhoeic women and recording whether oestrogen-withdrawal bleeding takes place. The results obtained indicate that stilboestrol sulphate is half as potent as stilboestrol, oestrone one-twentieth as potent, and equilin one-third as potent. "Toxicity" manifested as nausea was not encountered with these three oestrogens in the range of doses administered. Reasons are given for choosing this end-point and for the failure to devise any other



suitable method of assessment at different levels of oestrogenic response, such as relief of menopausal symptoms, the production of an oestrous vaginal smear, or the suppression of lactation.

CONSTANTINIDES, P. & GORDON, M. L. (1950.)

**The effect of some synthetic steroids on the morphogenetic action of stilbestrol, in the rat.**

—*Rev. Canad. Biol.* 9. 107–112. [In English. Authors' summary copied *verbatim*.] 2427

Three synthetic steroids were tested for their ability to prevent the tumorigenic effect of stilbestrol on the pituitary and adrenal gland. Of these, 17 ( $\beta$ )-ethyl-androstane-3-one-17 ( $\alpha$ )-ol proved a potent stilbestrol inhibitor of only moderate androgenic potency, while 17 ( $\beta$ )-ethyl- $\Delta^5$ -androstene-3 ( $\beta$ ), 17 ( $\alpha$ )-diol and 17 ( $\beta$ )-ethyl-androstane-3 ( $\beta$ ), 17 ( $\alpha$ )-diol showed no such activities.

TRENTIN, J. J. & TURNER, C. W. (1948.)

**Oral effectiveness of the dimethyl ether of diethylstilbestrol and of various steroid hormones on the mammary glands of mice and rabbits.**—*Bull. Mo. agric. Exp. Sta.* No. 411. pp. 1–33. 2428

Fed to rabbits, 0.2 mg. of the dimethyl ether of diethylstilboestrol per kg. grain ration was ineffective but amounts of 0.6, 1.8 or 5.4 mg. per kg. all promoted duct growth; 0.6 mg. per kg. caused no testicular atrophy or cessation of spermatogenesis but 5.4 mg. per kg. caused both. Addition of 500 mg. per kg. of a 20–25% progesterone concentrate to the diet of rabbits containing 0.6, 1.8 or 5.4 mg. oestrogen enhanced alveolar development but did not inhibit the stimulation of lactation.

In male mice, addition of 3.7 mg. (or over) per kg. feed caused loss in body weight during a period of four weeks. In nine weeks a level of 1.23 mg. per kg. feed caused neither gain nor loss of weight. Testicular atrophy was produced in four weeks on a diet containing 1.23 mg. per kg. and in nine weeks by 0.4 mg. per kg. or over. There was considerable variation in the responsiveness of different animals.

—MALCOLM WOODBINE.

SKALLER, F. & GRIGG, G. W. (1950.)

**The effect of orally administered synthetic oestrogen (hexoestrol) on the male fowl.**—*Aust. J. agric. Res.* 1. 496–516. [Author's summary modified.] 2429

In three experiments, involving a total of 141 male fowls, the effect of orally administered hexoestrol was observed.

The results support the hypothesis of a two-fold action of oestrogen, viz. its action as a stimulator during an initial period and as a depressor

of the anterior pituitary gland after a certain threshold level has been reached.

The sensitivity to oestrogen increased with age, varied according to different breeds, and according to tissue, e.g. it was higher for the testes than for the comb and epidermis. The size of the testes in three-month-old cockerels varied greatly and the amount of abdominal fat was not closely and reliably correlated with the total body fat.

Oestrogen treatment improved the appearance of the carcass. Deposition of abdominal fat was increased only for Australorps and mature birds. Capons were superior in body-fat production to the oestrogen-treated birds.

Fat from birds treated with hexoestrol (up to 25 mg. daily for three weeks) did not produce oestrogenic effects when injected into mice.

The observations did not support the hypothesis of Wheeler and Hoffman (1948) that oestrogen treatment increases the occurrence of prolapse and "pickout" [cannibalism].

SPÖRRI, H. (1950.)

**Hormontherapie in der Bekämpfung der Unfruchtbarkeit des Rindes.**

[Hormone therapy in the sterility of cattle.]—*Tierärztl. Umsch.* 5. 311–317. 2430

The physiology and pharmacology of hormone preparations are discussed and their therapeutic use in approximate types of sterility is indicated.—A. T. COWIE.

HEIDRICH, H. J. (1950.)

**Einiges über Fortpflanzungsstörungen beim Schwein.** [Reproductive disorders in swine.]—*Tierärztl. Umsch.* 5. 184–187. 2431

A discussion of the literature on infertility in the sow and the boar, and its treatment.

—ROY MACK.

KELLEY, R. B. (1950.)

**Inheritance of skin folding (wrinkling) of sheep.**—*Aust. J. agric. Res.* 1. 471–495. [Author's summary copied *verbatim*.] 2432

Experimental matings were designed to use, for  $P_1$  and  $P_2$  Border Leicester and wrinkled Merino sheep. These were considered possibly homozygous or nearly so for plain body and wrinkling and had the opposed characteristics of no skin folding and a high degree of it respectively. The matings progressively gave rise to  $F_1$ ,  $F_2$ , and  $F_3$  generations. Subsequently a backcross was made by mating  $F_1$  and  $P_2$ .

The investigation discloses that skin folding, or wrinkling, and the absence of skin folding, or plain body, are paired genetically as the two extremes of a range of characterization in which the ultimate types may be homozygous. Within

this multifactor situation genes responsible for plain body are possibly associated with epistatic effects. The situation gives rise to a series of heterozygous intermediates from which samples with particular gene frequencies may be withdrawn as breeds of sheep with defined characterization. Estimates of the heritability of either plain body or wrinkling within the samples will vary according to the particular gene frequency for which any estimate is made.

YOUNG, G. B. (1951.) **A case of tibial hemimelia in cattle.**—*Brit. vet. J.* **107**, 23–28. [Author's summary copied *verbatim*.] 2433

A new lethal abnormality in cattle called "tibial hemimelia" has been recorded, an anatomical description given, and pedigrees of the affected animals shown.

GETHIN, R. H. (1950.) **The age at first calving of dairy cattle in relation to subsequent performance.**—*Anim. Breed. Abstr.* **18**, 133–141. 2434

From a study of data in the literature over the past 20 years, G. concluded that the lifetime butterfat production of early calvers does not fall appreciably below that of the later calvers. Earlier first calvers are more economical producers than later calvers since they begin their production earlier in life and therefore have to be kept and fed for a shorter time in order to produce as much milk and butterfat as the later first calvers. It would appear that 24 months is

See also *absts.* 2248 (vibronic sterility); 2279–2280 (virus abortion of mares).

about the earliest age at which heifers may calve without deleterious effects. Moreover, even at this age management must be very good not only during pregnancy but also during the subsequent lactation.—A. T. COWIE.

HART, D. S. (1950.) **Photoperiodicity in Suffolk sheep.**—*J. agric. Sci.* **40**, 143–149. [Author's summary copied *verbatim*.] 2435

A gradually decreasing plane of light and increasing plane of darkness is not an essential factor for stimulating the onset of oestrus in sheep. Sheep being short-day breeding animals, a standard and regularly maintained rhythm of short-light and long-dark will stimulate the onset of oestrus. The terms short and long are used in the relative sense only, since their significance is solely a means of supplying the necessary contrast impulse to the pituitary gland. A ratio of 1 part of light to 2 parts or more of dark is sufficient to supply the contrast effect.

Oestrous cycles induced by artificial light rhythms appear to be normal in all respects, conforming to the normal intervals between heat periods and associated with the ovulation of normal ova. The anoestrous period varies in depth, and sheep which have just entered it may be brought back into oestrus very much faster than animals which are in deep anoestrus.

The milk yield of lactating ewes does not appear to be unduly depressed by the onset of oestrous periods induced by an artificial light-dark rhythm.

## ZOOTECNHY

DEONG, E. R., PEER, K. C. & FANCHER, L. W. (1950.) **A new generator for producing dry aerosols with organic insecticides.**—*J. econ. Ent.* **43**, 542–546. [Abst. from authors' summary.] 2436

A generator of "dry aerosol", an insecticidal agent free of auxiliary solvents, was described which propelled the insecticides into the atmosphere in micron size particles without the use of solvents, compressed gases, or combustion processes. The propelling agents were certain inert gases and steam formed by the reaction of chemicals.

Following deposition of the aerosol droplets consisting of insecticide and condensed water on surfaces, crystals formed and enlarged, projecting upwards from the surface, allowing maximum contact with the insect.

Residual deposits were uniform, but varied in distribution, being highest on horizontal sur-

faces, and lowest on vertical and inverted surfaces. Most of the common residual organic insecticides can be efficiently dispersed in this way, and a low-cost simplified method is presented of space kill and residual control of insects in confined spaces.

The use of dry aerosols for providing space-kill and residual protection against grain-eating insects in enclosed spaces is suggested to replace the more toxic gas fumigants such as hydrocyanic acid and methyl bromide, where contact with food materials can be minimized. Laboratory and commercial tests gave promising results.

LEGEAY, G. (1949.) **Appareil pour le transbordement des bovins. [Apparatus for transshipment of cattle.]**—*Bull. Serv. Elev. Industr. anim. A.O.F.* **2**, Nos. 2–3, pp. 35–36. 2437

The apparatus consists of two beams with three bands of webbing between them. The beast



is placed between the beams, which are then lifted until the bands touch the brisket and belly. Breast and breeching straps are then fastened in place, and the animal is hoisted clear of the ground, being steadied by two ropes, one from each end of the right-hand beam. It is then slung inboard. The animals do not struggle while being so hoisted. The apparatus is therefore superior to the net and to most other methods.—R. MACGREGOR.

BRUCE, H. M. (1950.) **Feeding and breeding of laboratory animals. XII. A note on the breeding of guinea-pigs without fresh green food.**—*J. Hyg., Camb.* 48. 338–345. [Author's summary copied *verbatim*.] 2438

Five generations of guinea-pigs bred successfully on diet 18 supplemented with crystalline ascorbic acid but without fresh green food.

No difference in reproductive performance was found between these animals and those of the normal breeding colony receiving unlimited supplies of fresh cabbage.

Symptoms of vitamin E deficiency appeared

See also *abst.* 2454 (behaviour of cattle).

among some young of the fourth and fifth generations, showing that diet 18 alone contained barely enough of this factor for continuous reproduction through many generations.

Diet 18, supplemented by hay and fresh green food to supply vitamin C and additional vitamin E, provides all the essential factors required by the guinea-pig.

EATON, O. N. (1949.) **Hamster raising.**—*U.S. Dep. Agric. leafl.* No. 250. pp. 1–6. 2439

Brief details are given of the uses, feeding, housing, breeding and causes of death in golden hamsters. Among causes of loss are included infections derived from wild rodents, cage paralysis (said to be associated with lack of vitamin D and inadequate exercise), dystocia arising from pelvic malformations, starvation as a result of dental breakages or malformations, fighting, lack of water, and cannibalism.

There is a note of caution regarding the potential danger to crops of allowing these animals to escape and possibly form wild colonies.—ALASTAIR N. WORDEN.

## TECHNIQUE AND APPARATUS

MALAN, C. E. (1947.) **Apparecchiatura elettrica sostituyente il becco Bunsen o la lampada ad alcool nelle operazioni di isolamento e di trapianto dei microrganismi.** [An electrical apparatus to replace the Bunsen burner and alcohol lamp in isolating and transplanting micro-organisms.]—*Ann. Microbiol.* 3. 6. [Abst. in *Rev. appl. Mycol.* 30. 57. (1951), copied *verbatim*.] 2440

The author describes the construction of two small electric ovens of his own design, one for sterilizing platinum inoculating needles and the ends of the holders, and the other for the mouth of the test tube and the cotton-wool plug. The devices permit rapidity, regularity, and efficiency, especially in making serial transfers, but for general purposes they cannot completely replace the Bunsen flame.

MALAN, C. E. (1947.) **Conservazione di preparati microbici con la vernice all'acetilcellulosa.** [The preservation of microbial preparations with a cellulose acetate varnish.]—*Ann. Microbiol.* 3. 3. [Abst. in *Rev. appl. Mycol.* 30. 57. (1951), copied *verbatim*.] 2441

The author preserves fixed, stained slide preparations of bacteria by covering the mount with a layer of cellulose acetate dissolved in

acetone or in acetic acid. This rapidly drying varnish leaves a thin, adherent film which does not impede observation through the oil-immersion objective. Its insolubility in benzene and petroleum spirit allows the film to be washed with these substances, thus enhancing its preservative powers.

KLIGMAN, A. M. & MESCON, H. (1950.) **The periodic acid-Schiff stain for the demonstration of fungi in animal tissue.**—*J. Bact.* 60. 415–421. 2442

The chemistry of the Hotchkiss-McManus staining technique is discussed, and the procedure is described. The authors consider the method superior to any previously employed. The wall of the fungus is selectively and intensely stained, and the organism can be readily differentiated from debris and cellular elements.

—W. R. BETT.

KLIGMAN, A. M., MESCON, H. & DELAMATER, E. D. (1951.) **The Hotchkiss-McManus stain for the histopathologic diagnosis of fungus diseases.**—*Amer. J. clin. Path.* 21. 86–91. [Authors' summary slightly modified.] 2443

With the Hotchkiss-McManus technic, fungi causing superficial and deep mycoses have been shown to be selectively stained in tissue, taking various shades of red, while the animal tissue

to all intents and purposes remains unstained. This simple differential stain is here shown to be readily adaptable to the histopathologic detection of fungi in tissues and is recommended for this purpose. It is at present being applied as a routine procedure in the authors' laboratories.

RHODES, M. (1950.) **Preservation of yeasts and fungi by desiccation.**—*Trans. Brit. mycol. Soc.* 33. 35–39. [Abst. in *Rev. appl. Mycol.* 29. 523. (1950), copied *verbatim*.] 2444

Cultures of fungi and yeasts intended for preservation by drying at the National Collection of Type Cultures, Elstree, were grown on a solid medium. Non-sporing organisms were dried as soon as good growth developed, and sporing genera when spores were produced. A loopful of culture or a small piece of mycelium, where possible with spores, was macerated in a loopful of sterile horse serum on the inner wall of a plugged sterile test-tube. This tube was placed in a wider one, at the bottom of which was a little phosphorus pentoxide. The drawn-out end of the outer tube was attached to a pump, and when the vacuum was satisfactory, sealed off at the constriction. Dried cultures were stored at room temperature in the dark. To recover the organisms about 1 ml. of liquid medium was pipetted into the small tube, which was then incubated. On revival some genera spored better than cultures from the same organisms maintained on the usual media.

Nearly 88 per cent of the 405 cultures of 61 genera survived for periods up to 13 years, and it appears that if a culture survives drying by this method it will remain viable indefinitely.

WILSON, J. W. (1945.) **An improved method for preparing permanent slides of fungus cultures.**—*Arch. Derm. Syph., N.Y.* 52. 267. [Abst. in *Annot. Bibl. med. Mycol.* p. 176. (1947), copied *verbatim*.] 2445

The method here proposed for the preparation of permanent slides of fungus cultures is a modification of that described by Diehl in *Science*, 69. p. 276. (1929.)

KULKA, D., PRESTON, J. M. & WALKER, T. K. (1951.) **The photographic examination of giant colonies.**—*J. gen. Microbiol.* 5. 18–21. [Authors' summary copied *verbatim*.] 2446

An apparatus was designed to photograph colonies of micro-organisms on Petri dishes either under conditions of darkfield illumination or of top-lighting. It serves to reveal any motility of the organisms and is valuable as an aid to identification, particularly in the genus *Acetobacter*, members of which have characteristic giant colonies.

SAYLOR, C. P., BRICE, A. T. & ZERNIKE, F. (1950.) **Color phase-contrast microscopy: requirements and applications.**—*J. opt. Soc. Amer.* 40. 329–334. [Part of abst. in *Stain Tech.* 26. 67. (1951), copied *verbatim*. Signed: G. C. CROSSMON.] 2447

For the use of color phase contrast in microscopy, several difficult requirements must be met for the attainment of maximum brilliance and usefulness. The system itself is one in which a controlled chromatism of the phase plate is sought instead of the customary control of phase difference at one wave-length only. The thickness and dispersion of the phase ring in relation to the general aperture can be such that zero phase contrast will occur at one or more wave-lengths of transition in color sensation. If the phase contrast is made high but opposite in several zones of relatively pure color sensation, striking and beautiful microscopical images are formed with objects of low inherent contrast. The greatest advantage of the system lies not in the beauty of the images, but in the clear distinction which is afforded between effects caused by scattering of general absorption and those caused by small differences of refractive index or thickness.

CHIFFELLE, T. L. & PUTT, F. A. (1951.) **Propylene and ethylene glycol as solvents for Sudan IV and Sudan black B.**—*Stain Tech.* 26. 51–56. [Authors' abst. copied *verbatim*.] 2448

Propylene or ethylene glycol is recommended as a solvent for Sudan IV and Sudan black B to replace the commonly used alcohol-acetone mixtures for general lipid staining in tissue sections. Either glycol is used as a dehydrating agent, dye solvent, and differentiating solution. They offer the advantages of a stable solution, inert with respect to solubilities of lipid material in it, and excellent control of differentiation without loss of dye from lipid particles. Sections remain pliable and are not shrunk by the glycols. Counterstains may be used after staining with Sudan IV but are generally not necessary after staining with Sudan black B. With the use of propylene glycol as a solvent, Sudan IV appears to equal the staining ability of Sudan black B as regards the type of lipid material detected, and the choice of dye to be used would depend on the color contrast desired.

LHOTKA, J. F. & DAVENPORT, H. A. (1951.) **Aldehyde reactions in tissues in relation to the Feulgen technic.**—*Stain Tech.* 26. 35–41. [Authors' abst. copied *verbatim*.] 2449

The nature of the Schiff-positive radical responsible for the Feulgen reaction was studied



by several standard tests for aldehyde. Oxidative, amine, alkali, and catalytic reactions for aldehydes were used. An aldehyde reaction, similar histologically to the Feulgen, could not be produced by the oxidative and amine technics. However, by means of alkali and catalytic methods, it was possible to block the Feulgen-positive tissue radicals ordinarily released by acid hydrolysis. A second hydrolysis of the tissues (after the blocking reactions) restored most of their original Feulgen-positive characteristics.

NASSAR, T. K. & SHANKLIN, W. M. (1951.) **Staining neuroglia with silver diamminohydroxide after sensitizing with sodium sulfite and embedding in paraffin.**—*Stain Tech.* 26. 13-18. [Abst. from authors' abst.] 2450

Pieces of brain are fixed in formalin ammonium bromide for about 4 days at room temperature, and embedded and sectioned. The sections are sensitized in 5% sodium sulfite for 2 hours, washed in distilled water, impregnated with silver diamminohydroxide solution 2-5 minutes at room temperature, reduced in 2% formalin,

washed in distilled water and toned in gold chloride, fixed in 5% hypo, counterstained with 1% picric acid, dehydrated and mounted in balsam. Equally good results are obtained by impregnating with Hortega's strong silver carbonate. The microglia, oligodendroglia, fibrous and protoplasmic astrocytes in the cat, rabbit, newborn and adult human are successfully stained by this method.

BOGOROCH, R. (1951.) **Detection of radio-elements in histological slides by coating with stripping emulsion—the "strip-coating" technic.**—*Stain. Tech.* 26. 43-50. [Author's abst. copied verbatim.] 2451

The "strip-coating" technic offers some improvement of the published methods for the autographic detection of radio-elements in sections by stripping films. Reproducible results are easily obtained with Ilford Half Tone Stripping Plate Emulsion. The method does not lend itself readily to the preparation of the large number of slides usually required for biological research.

See also absts. 2274 (cultivation of influenza virus); 2301 (injection of insects with insecticides); 2415 (staining of spermatozoa); 2436 (insecticide aerosol generator); 2437 (trans-shipment apparatus for cattle); 2466 (book, P.M. examination).

## MISCELLANEOUS

FOGG, L. C. & COWING, R. F. (1951.) **The changes in cell morphology and histochemistry of the testis following irradiation and their relation to other induced testicular changes. II. Comparison of effects of doses of 1,440 r and 5,050 r with 300 r.**—*Cancer Res.* 11. 81-86. [Authors' summary copied verbatim.] 2452

Evidence is presented to show that a dose of 1,440 r does not destroy all the germinal elements at any time; there is a sequence for radiation reaction from gonium to sperm, and there is an eventual reduction of production. In comparison to 300 r, it is indicated that a single dose of 1,440 r further reduces the frequency of the appearance of the germinal cells and delays the time of recovery for spermatogonia and spermatocytes. There is also less evidence of numerical variation in the spermatogonia and spermatocytes and less marked peaks and depressions in the figures. An acute dose of 5,050 r destroys all the germinal elements, but all these elements do not disappear at the same time. The gonium disappear first, followed by the spermatocytes, spermatids, and sperm. Once each of the types of germinal elements starts to disappear, the rate is approximately the same, regardless of the dose. The degree of injury is relative to the magnitude of the dose. No marked pathological change was noted in

cells or tissues other than in the true germinal cells.

PADY, S. M., PETURSON, B. & GREEN, G. J. (1950.) **Arctic aerobiology. III. The presence of spores of cereal pathogens on slides exposed from airplanes in 1947.**—*Phytopathology.* 40. 632-641. [Abst. in *Rev. appl. Mycol.* 30. 56. (1951), copied verbatim.] 2453

In the course of four flights during August and September, 1947, in the Arctic and sub-arctic regions, 52 vaseline-coated slides were exposed for five minutes at altitudes of 4,000 to 5,000 ft. Among the spores trapped were those of *Puccinia graminis*, *P. trititina*, *Helminthosporium sativum*, *H. sp.*, and smuts (*Ustilago* and *Tilletia* spp.). In two flights beyond the Arctic Circle, and in the third, beyond the tree line, the spore numbers were low and probably not significant. The fourth flight, from Yellowknife, Northwest Territories, to Edmonton, Alberta, yielded significant numbers of spores of all the above-mentioned species. The prevalence of the associated cereal diseases in Western Canada and the adjacent areas of the central United States is reviewed.

BROWNLEE, A. (1950.) **Studies in the behaviour of domestic cattle in Britain.**—*Bull. Anim.*



*Behaviour*. No. 8. pp. 11-20. [Author's summary slightly modified.] 2454

The following behaviour patterns in cattle are described:—(a) those potentially capable of manifestation in the new-born calf—locomotion, rest, hunger for milk, desire for protection, defaecation, urination, stretching, shaking, play, fear and curiosity, skin hygiene, startle. (b) those manifested in later life only:—postural habits of post-calfhood, hunger for vegetable food and other substances, rumination, combat, head shaking (challenge?), jealousy, disgust,

oestrus (Hammond 1927), parturition, parental protective behaviour. An instance of "vacuum" activity in cattle is given. Factors which inhibit "vacuum" activity, rumination, stretching and skin hygiene behaviour are described. Some reactions to climatic conditions are described. Instances of evidence of memory are given. There is no evidence that normal cattle with functioning rumen ever sleep. The importance of such studies in animal husbandry, veterinary pathology and pure biology is briefly discussed.

## REPORTS

ANON. GREAT BRITAIN. (1950.) *The Animal Health Trust. Fourth report 1st July, 1949-30th June, 1950.* pp. 82. London: The Animal Health Trust. 2455

The Trust has continued its policy of encouraging suitable workers to take up research by awarding undergraduate grants, research training scholarships, and research fellowships. Separate stations have been set up to study problems connected with horses, dogs, poultry, and farm livestock in general. At these, and at other institutions where research fellows are studying, investigations into some 20 diseases are being undertaken.

An advisory service is already in being and it is hoped that inauguration of a hospital scheme will not be long delayed.

Apart from papers for publication in scientific journals, members of the Trust have been associated with production or pamphlets surveying the present state of knowledge of various diseases, written in simple language for the information of the lay public.—G. B. S. HEATH.

KENYA. (1950.) *Department of Veterinary Services Annual Report, 1948.* pp. 30. Nairobi: Govt. Printer. Sh. 2. 2456

There were few outbreaks of rinderpest on European farms during the year and in native areas few only occurred, all being in Masai. The vast Northern Frontier Province is not included in the area under consideration for limitation of staff prevents any attention being paid to the disease position there. Nearly 600,000 KAG inoculations were done by the staff during the year.

The position in regard to bovine contagious pleuro-pneumonia was not so satisfactory. Outbreaks occurred in Masai and Samburu and on European farms. The probable cause of these outbreaks was the illicit movement of stock.

There were more outbreaks of F. & M. DISEASE on European farms than in 1947; but fewer of EAST COAST FEVER.

More attention was paid to the problem of sterility in cattle and in the Kitale and Limura areas, where artificial insemination schemes are actively supported by large numbers of farmers, there was a steady improvement of the reproductive rate in dairy cows. The Central Artificial Insemination Station issued 18,710 ml. of bull semen as against 7,595 ml. in 1947.

AFRICAN HORSE SICKNESS was not prevalent and there were no outbreaks of AFRICAN SWINE FEVER during the year. Sheep diseases were not so serious as in recent years. There were no outbreaks of RIFT VALLEY FEVER. CALF DISEASES were again an important cause of loss to stock owners.

Vaccine production, except of AFRICAN HORSE SICKNESS vaccine, was transferred to the East African Veterinary Research Organization.

Of the avianized rinderpest virus strains described in the report for 1947, the K strain caused mortality up to the 35th passage on the chorio-allantois. Attenuation for cattle then continued progressively and at the 80th passage the cattle reacted very mildly. With the L strain, attenuation was first apparent at the 45th passage. This strain also provoked very mild reactions at the 80th chorioallantoic passage. K was adapted to the yolk-sac after the 33rd and L after the 26th chorioallantoic passage. Up to about the 15th yolk-sac passage the virus still produced mortality: after 30 passages there was no reaction and no immunity. Cattle inoculated with the 70th to 80th passages of each strain were killed at the height of the reaction and their spleens were dried. 2 ml. of a 1:250 dilution of each of these dried products were inoculated into cattle which reacted and they were immune on challenge.



RINDERPEST virus was found to survive in bone marrow for 15 days at  $-5^{\circ}\text{C}$ . At 28 days a little virus may have survived. Virus survived for 48 hours in bone marrow at room temperature, but survival was doubtful after 96 hours.

The first outbreak of LEPTOSPIROSIS OF DOGS to be confirmed in Kenya was recorded. The organism involved was pathogenic for mice and g. pigs. *Aegyptianella pullorum* was found in a duck and *Trichomonas columbae* in an imported racing pigeon. Field trials on the treatment of FASCIOLIASIS in sheep and cattle with stibophen failed to give a conclusive result. Cases of eye trouble in adult animals following treatment with phenothiazine were investigated.

An interesting account is given of the examination of lesions which resembled TUBERCULOSIS in the lymph nodes of pigs. Several hundred were handled; but in only five instances were solitary acid-fast bacilli found. Inoculated g. pigs did not develop TB. Six fowls were inoculated intravenously with caseous material without producing infection. Histologically the lesions suggested a chronic inflammatory process; but the picture was not typical of a tuberculous lymph node.

The hereditary condition, MYODYSTROPHIA FOETALIS DEFORMANS, was diagnosed in lambs born to indigenous ewes served by a grade ram.

A brief account of Anderson's research work on reproductive physiology at the Experimental Station, Naivasha, is given and there is also a report from Lewis, the Chief Field Zoologist, on the Trypanosomiasis and Tsetse Survey and Control.

The usual statistical data on livestock products, etc. are given.—J. RICHARD HUDSON.

**EAST AFRICA. (1950.) East African Tsetse and Trypanosomiasis Research and Reclamation Organization. Annual Report 1949. pp. 26.**

Nairobi: East Africa High Commission. 2457

In order to give the closest possible co-ordination, the East African Tsetse Research, Trypanosomiasis Research and Tsetse Reclamation services are now amalgamated into one organization. The present scheme of work is based on Buxton's proposals. Preliminary proposals for the period 1951–56 are at present before the East African Government.

This report gives a short summary of research that has been completed or is in progress. Studies on fly habitats, breeding sites, behaviour and the effects of game destruction are described by the Chief Entomologist, Potts, W. H. The TRYPANOSOMIASIS research recorded, being a summary of the work that has been done at Tinde, is almost entirely confined to the well

known investigations that have been continued there over a number of years on the polymorphic group. Lewis, E. A., contributes an account of the experimental reclamation schemes, two in Tanganyika Territory, three in Kenya and one in Uganda. These cover areas where *G. morsitans*, *G. pallidipes* and *G. palpalis* are the important species and deal with such methods as hand-catching, discriminative clearing and the use of gammexane smoke.

A programme of experiments on the prophylactic value of antrycide has been begun under the combined direction of the E.A.T. and T.R.O. and the East African Veterinary Research Organization. A new field station for this work is to be established at Mariakani near the coast of Kenya. Recent observations would suggest that "the ease with which acquired resistance to antrycide can be produced will make it difficult, if not impossible, to use the drug for large scale prophylaxis in East Africa".

The Organization provides an advisory service on tsetse and TRYPANOSOMIASIS problems for the East African territorial governments.—J. RICHARD HUDSON.

**HOLLAND. (1947.) Mededelingen betreffende de Gezondheidsdienst voor Vee in Friesland 28e Jaarverslag 1 Mei 1946–30 April 1947. [Annual report 1946–47 of the Veterinary Department, Friesland.] pp. 49. 2458**

The total number of specimens examined by the laboratory during the year was 19,826 of which 3,420 were for TB. (90 positive), 1,776 for JOHNE'S DISEASE (264 positive), 766 for various UDDER INFECTIONS (250 positive), 11,156 for ABORTION (775 positive) and 813 for other diseases of cattle and calves, 394 from horses and foals, 46 from pigs, 13 from sheep, 184 from poultry and the remainder from goats, dogs, rabbits and other animals. A number of meat samples and bacterial cultures were also examined.

356,535 ml. of *Brucella abortus* vaccine, 52,340 ml. of tuberculin for eye tests and 10,982 ml. for skin tests were produced. A total of 253,600 ml. of vaccines against JOINT ILL, SWINE ERYSIPELAS, HAEMORRHAGIC SEPTICAEMIA in pigs, TETANUS, SWINE FEVER, and various other infections was obtained from the state serum depot.

During the year about 275,000 cattle were tuberculin tested and there were 5,000 positive reactors; of a total of 16,000 dairy herds, over 14,000 were free from TB.—E. G.

**DENMARK. (1949.) Årsberetning fra Veterinaerdirektoratet for Året 1947. [Denmark:**



**Annual report of the Veterinary Service for the year 1947.]** [NIELSON, F. W.] pp. 141. Copenhagen: Universitets-Bogtrykkeri. [French summary.] 2459

During 1947 there were five outbreaks of ANTHRAX in cattle, 20 of F. & M. DISEASE, 8 of FOOT ROT in sheep, 11 of EQUINE INFECTIOUS PARAPLEGIA, 11 of ENZOOTIC MENINGITIS in cattle, 5 of MANGE in horses and 53 of DISTEMPER in fur bearing animals.

Extracts are given from the reports of district veterinarians about other less important diseases—EQUINE INFECTIOUS BRONCHITIS, STRANGLES, a paralytic disease of horses, TETANUS, "FOUL OF THE FOOT" in cattle, ACTINOMYCOSIS and COCCIDIOSIS in cattle, nutritional diseases in swine, AVIAN COCCIDIOSIS, BLACKHEAD in turkeys and DOG DISTEMPER.

With regard to AVIAN SALMONELLOSIS, there were 2,162 approved hatcheries in operation, for the supply of stock free from PULLORUM DISEASE. In the campaign against BOVINE BRUCELLOSIS 20,600 specimens were diagnostically examined: only 363 out of 13,226 blood samples were positive, but all except 359 of 2,930 placenta samples were positive. A "vaccine" was extensively used in 6,755 herds.

Tuberculin testing was carried out in 68,051 herds of cattle and at July 1948, 100% of them were non-reactors.

OX WARBLE INFESTATION was detected in 21% of 121,712 herds examined.

Information is given of some animal poisoning cases. In a livestock census, 572,500 horses, 3,013,500 cattle, 1,830,000 pigs, 91,400 sheep and 18.8 million head of poultry were enumerated. There were also 7,500 foxes, 60,000 mink, 4,000 polecats and martens and 28,600 nutria, kept on 2,500 fur-animal farms.

The usual information is given about meat and milk control.—J. EDWARDS.

**GERMANY. (1946.) Military Government veterinary report for period January to July 1946.** pp. 17.—Veterinary Section, Public Health & Welfare Branch, Internal Affairs & Communications Division, Office of Military Govt. for Germany (U.S.) [Mimeographed.] 2460

The main difficulty experienced by the administration was lack of staff due to normal wastage and removal of personnel for political reasons. A large influx of refugees from the Eastern Zone, accompanied by their animals, gave rise to dangers of RABIES, GLANDERS and DOURINE, but these were overcome by efficient quarantine methods. SWINE FEVER was introduced by the feeding of U.S. Army swill, but the outbreaks were dealt with by crystal violet

vaccine prepared in Bavaria. Attempts were made to limit the spread of F. & M. DISEASE by quarantine methods, but these broke down owing to the need for allowing the animals out to graze as there were no other foodstuffs available and arrival of vaccine was awaited. The incidence of TB. in cattle was estimated at 30–40%.

The meat and milk inspection services were also crippled by lack of staff. The laboratories were badly damaged, but were able to start work. Veterinary schools were at a standstill, but the one at Giessen was reopened and also three others outside the U.S. Zone.—R. MACGREGOR.

**U.S.A. (1949.) Michigan. Report of the School of Veterinary Medicine, Michigan State College, East Lansing, 1949.** [Bryan, C. S.] pp. 67. 2461

A degree of Bachelor of Science in Medical Technology is now being offered.

MASTITIS OF CATTLE is an important problem, and little headway has been made in an attempt at eradication. Progress in the control of BRUCELLOSIS continues to be encouraging, and the new Brucella (M) vaccine is having extended trials.

The incidence of RABIES is increasing.

—G. B. S. HEATH.

**U.S.A. (1948.) State of California. Department of Agriculture. Twenty-ninth Annual Report for the period ending December 31, 1948.** [Anon.]—*Bull. Dep. Agric. Calif.* 37. Items of veterinary interest pp. 341–359.] 2462

Any tuberculous lesion found by a meat inspector is reported to the Bureau of Livestock Disease Control; under the prevailing system, the origin of any carcass can be discovered, and the herd from which the tuberculous carcass was obtained is then scheduled for retesting on the following basis: Dairy herds to require two negative tests at 60–90 day intervals and a third test in six months, and beef herd to have one negative retest in six months.

The law requires the vaccination against BRUCELLOSIS of all female dairy calves in the State and provides that male dairy calves and beef calves may be vaccinated at the option of the owner. A "Brucellosis Free" certificate is issued when a herd of pigs has had two successive negative agglutination tests at an interval of not less than 30 days.

BRACKEN, or FERN, POISONING [unfortunately, it is not clear from the paper whether the plant concerned was *Pteris aquilina*] killed 36 of 100 Hereford cattle. The course of the disease, clinical signs, and gross morbid anatomy described are identical with BRACKEN POISONING encountered in Great Britain.—G. B. S. HEATH.



FRENCH GUIANA. (1948.) Rapport sur le fonctionnement technique de l'Institut Pasteur de la Guyane Française et du Territoire de l'Inini pendant l'année 1947. [Report on the activity of the Pasteur Institute of French Guiana and the Territory of Inini during 1947.] pp. 101. [Items of veterinary interest pp. 82-86.] Cayenne: Imprimerie Officielle. 2463

Cattle appear to have been affected more by nutritional than by contagious disease; outbreaks with heavy mortality were therefore rare. There was only one case of *SALMONELLA BOVIS-*

MORBIFICANS infection. All cattle on hire were vaccinated with anti-ANTHRAX spore vaccine.

There was a heavy incidence of STEPHANURIASIS among pigs; about one third of the livers examined had cysts of *Stephanurus dentatus*. Two outbreaks of disease among laboratory animals, one of *Salmonella typhi-murium* and the other of *Pasteurella muriseptica* infection, were controlled by vaccines. A mixed salmonella-pasteurella vaccine was freely used on poultry with excellent protective and some curative effect.

—R. MACGREGOR.

## BOOK REVIEWS

FOSTER, J. W. [Professor of Bacteriology, University of Texas, Austin, Texas.] (1949.) *Chemical activities of fungi*. pp. xviii + 648. New York: Academic Press Inc. \$9.50. 2464

This fine book which is up to date to the end of 1948, fills a gap in one of the fields of biochemistry. Together with Gale's *Chemical Activities of Bacteria, Bacterial Metabolism* and the more technical *Industrial Microbiology* of Prescott and Dunn, a full coverage is now possible in chemical microbiology.

This volume also deals with industrial utilization of fungi. Although most important developments are in the production of penicillin and other antibiotics, hydrolytic enzymes, vitamins and organic acids are obtained by the use of fungi. The production of proteolytic, diastatic and pectic enzymes is now well established and gluconic, citric, fumaric, and gallic acids are commercial products while the production of kojic, D-lactic and itaconic acids awaits application. Riboflavin is now manufactured on a large scale by use of the fungus *Ermothecium ashbyii*.

The author suggests with reason that once a substance is found to be of value, it should be possible, by systematic microbiological study, to find a mould and define the conditions for producing cultures richer than animal or plant products in the required material. Moulds can synthesize protein from molasses and inorganic N and they may be of value in the future for the supply of essential amino-acids. Fat also is produced by moulds. The section dealing with this subject is a most useful selected digest of the literature available.

The book is well printed and produced and is a pleasure to handle. The price may be prohibitive perhaps for private buying, but the volume will be of service as a valuable reference book for those whose work, whether teaching

or research, brings them into contact with moulds.—MALCOLM WOODBINE.

KRÜGER, G. (1950.) *Der anatomische Wortschatz unter teilweiser Mitberücksichtigung der Histologie und der Embryologie für die Studierenden der Veterinärmedizin. [Dictionary of anatomical terms.]* pp. 95. Leipzig: S. Hirzel, DM. 5. 2465

This useful little dictionary of Latin and Greek anatomical terms and their German equivalents should prove a valuable aid to German veterinary students interested in the etymological origin of terms and to those who have not had the benefit of a classical education. The rudiments of Greek and Latin grammar are given in a brief outline.—E. G.

DOBBERSTEIN, J. (1950.) *Richtlinien für die Sektion der Haustiere für Tierärzte und Studierende der Veterinärmedizin. [Directions for the post-mortem examination of animal tissues.]* pp. 111. Berlin: Richard Schoetz. 7th Edit. DM. 6.80. 2466

The author has brought this excellent little book up to date with the addition of the latest techniques for *post-mortem* examination of the domestic animals and a section on the rabbit.

The general plan of the book is to describe routine P.M. procedure, followed by more detailed instruction on the correct method of exposure and sectioning of individual tissues and organs, and to relate the whole to anatomical descriptions of the normal. There is nothing very original in this, but the method of presentation is good. An interesting chapter deals with normal weights, measures and volumes, information surprisingly lacking in textbooks of anatomy; and another with procedure for despatch of material for P.M. examination in a laboratory.

The book will be found of value to practitioner, anatomist and pathologist alike.

—C. W. OTTAWAY.